THE

GEORGE WASHINGTON UNIVERSITY

NAVY GRADUATE COMPTROLLERSHIP PROGRAM

SAILING DIRECTIONS FOR SHOP SUPERINTENDENTS

By

J. C. Dyson

For

Doctor A. Rex Johnson

January 1955

FORLWORD

When I assumed the billet of Shop Superintendent in September 1952 I thought that I had a fair understanding of shipyard organization and basic responsibilities and, in general, of the responsibilities of a Shop Superintendent. I was of this opinion because at that time I had some six and a half years of progressive responsibility in shipyard duty and had held jobs as Ship Superintendent, New Construction Superintendent, Senior Assistant Repair Superintendent, Design Superintendent, Planning and Estimating Superintendent, and Repair Superintendent, all in that sequence prior to becoming Shop Superintendent. However, I soon found that I did not really know the functions of the Shop Superintendent's office as well as I thought. Each day I encountered new problems which I had never realized existed and, even after two years in the billet, I still met with new situations which required all of my past training and also new study to reach a solution.

When I realized that all too soon I would be detached and some other individual would have to go through the same process of breaking in on the job, I reviewed the past two years and my progressive education in the duties of Shop Superintendent. At that time I made a firm commitment to myself to write a manual of guidance for the Shop Superintendent's billet at the Puget Sound Naval Shipyard.

This write-up is therefore offered for whatever assistance it may be to future Shop Superintendents in the hope that they may be more effective in the billet sooner than I was.

I wish to take this opportunity to acknowledge the excellent tutors I have had in the persons of the Engineering Duty Officers under whom I have served during the past twelve years and the senior civilians I have been associated with.

14 January 1955 J. C. DYSON

TABLE OF CONTENTS

Page

FOREWORD ii

INTRODUCTION 1

Chapter

I. PRODUCTION FACILITIES 4

Machine Tools and Plant Appliances
Portable Power Tools
Loose and Hand Tools
Tool Engineering
Building and Space Requirements
Facilities and Review Boards
General

II. PRODUCTION PROCESSES AND PROCEDURES 17

General
Plant and Processes Branch
Welding Branch
Laboratory Branch
Shipyard Industrial Chemicals Committee
Conclusion

III. INDUSTRIAL RELATIONS. 23

Personnel
Supervisor Selection
Trade Cognizance
Training
Safety

IV. MANUFACTURING AND NON-SHIP WORK 38

Control Features
Inspection Responsibility
Damage and Waste
Overhead Work

Chapter Page

V. SHIP WORK 43

Trade Cognizance
Work Assignment Between Shops
Production Processes and Procedures
Implementation
Special Tools and Equipments

VI. BUDGET ADMINISTRATION 46

Preparation of the Budget
Execution of the Budget
Budget Analysis
Cost Accounting
Budget Reports
Overhead Rates

VII. ADMINISTRATIVE SERVICES 54

Administrative Methods and Procedures
Forms and Reports Control
Organization Maintenance
Work Standards and Work Measurement
Performance Evaluation
Mobilization Planning
Conclusion

VIII. MISCELLANEOUS SERVICES 61

Inspections
Space Control
Beneficial Suggestions
Longevity Pins

IX. RELATION TO OTHER STAFF GROUPS 65

Inter-Departmental
Intra-Departmental
Conclusion

X. SHOP SUPERINTENDENT'S ORGANIZATION 74

Organization
Staffing

XI. COMPTROLLER OF THE PRODUCTION DEPARTMENT . . . 79

Chapter Page

XII. A MANAGER AND ADMINISTRATOR 86

APPENDIX 90
(Sample Organization Charts and Directives)

Production Department Organization Chart
Production Department Instruction 5400.1
Production Department Instruction 5400.2

INTRODUCTION

The first thing that a good Shop Superintendent must be cognizant of is his status (position) in the hierocracy of the Shipyard. A proper understanding of this situation makes for ease of operation which will many times confound those who try to confuse the issue. I prefer to think of the various relationships in terms of a sun and its planets circling in orbits about it rather than a conventional organization chart.

The ultimate purpose of any Shipyard is "Service to the Fleet" and this must never be forgotten. The agency wherein this service is rendered to the fleet is, basically, the productive worker within the Production Department shops. Therefore, these productive workers establish the "reason for being" of all the other functions of the Shipyard, and the relative importance of these other functions can best be evaluated on the basis of the degree of support which they can render to the productive worker. With this in mind, let us assume that the productive shops constitute the nucleus or sun of this galaxy. In the first orbit, adjacent to the sun, I would place the three divisions of the Production Department - the Repair Division, the Production Analysis Division, and the Shop Superintendent's Division. The shops, of course, answer directly to the Production Officer; however, he delegates to the Repair Division the responsibilities for dealing with the shops on all ship work. And in the same manner, he delegates to the Shop Superintendent the responsibility for all manufacturing and non-ship work. These are the line responsibilities. The Production Analysis Division is a staff function to

provide for production control and shop planning implementation. Within this division, central scheduling is carried out, material expediting, and such other production analysis functions as appropriate to assist the Production Officer, his assistants, and the shops in carrying out their basic responsibilities. The Shop Division, in addition to its line responsibilities for manufacturing and non-ship work, has the many other administrative staff responsibilities the accomplishment of which are needed for the department to properly operate. Within this category fall such functions as providing production processes and procedures required to carry out the work assigned to Production, including those which will be established by the Plant and Processes Branch, Welding Branch, and the Laboratory Branch. In addition, a closely related function to the productive output is that of trade cognizance determination. The Shop Superintendent has primary responsibility in maintaining adequate definitions of trade cognizance assignment. In order that any work be done, the Shop Division must provide for the proper plant facilities, which include machine tools and plant appliances. He has the primary responsibility for the whole Shipyard on loose and hand tools and portable power tools, his agents in this matter being the Plant and Processes Branch and Shop 06. The important function of budget analyzation falls to his lot. The budget for the Production Department must be coordinated within the Shop Superintendent Division through the Administrative Branch which prepares the budget, conducts review and surveillance of execution and consults with the Comptroller's Department on overhead determination in the various shops. Industrial relations that function which has ballooned to such proportions in recent years, is handled for the Production Department by the Shop Division. Some time ago, to provide for more efficient operation, all the laboratory functions of the

Shipyard were consolidated into one laboratory. This laboratory is under the Shop Superintendent and provides services to the complete Shipyard. The Administrative Branch carries out all the miscellaneous services which must be performed but which no one ever thinks about, such as directives preparation, provision of office supplies, review of forms requisitions, collecting for the Community Chest, etc.

In the next orbit, a little further removed, we find such groups as the Supply, the Planning, the Public Works and Ordnance Departments. These departments provide a large amount of support to the productive effort and are in constant contact with the coordinating agencies within the Production Department. At the next orbit of influence, I arbitrarily place the Industrial Relations and Comptroller's groups. These people set up rules of operation, of personnel administration and of money administration which filter down into our field, but to the shops only to the extent necessary to carry out their functions. In the outer orbit appear service departments which are quite necessary, yet whose direct influence on the productive shops is only slight. These would include the Medical Department, Dental Department, Industrial Engineering Department.

I have broken down my presentation of information into chapters in a sequence which appeared logical to me at the time of preparation. The order of the chapters does not necessarily indicate the relative importance of the information presented therein. Instead, it represents the sequence in which the information comes to mind as you think of the job to be done. In addition I have provided as appendices current applicable organization charts and extracts from the Shipyard directives for information.

CHAPTER I

Production Facilities

The production facilities, under the cognizance of the Shop Superintendent, have an approximate value of thirty million dollars. These facilities represent a major asset of the Navy Department and should be treated accordingly. I like to think of the equipment in various categories such as: fixed or portable machine tools and plant appliances, portable power tools, and loose and hand tools. With respect to these facilities, it is incumbent upon the Shop Superintendent, as soon after he occupies the billet as is feasible, to read the Bureau of Ships pamphlet Manual for Administration of Facility Programs at Field and Fleet Activities. This book details the manner in which the program of procurement, replacement, or rehabilitation of equipment can be carried out.

Machine Tools And Plant Applicances

In order to be prepared and to make an intelligent decision concerning acquisition of new equipment for replacement of old, management must have available a reasonable criteria to assist in its analysis of the situation. There is being initiated at this time in Shop 06, under the guidance of the Plant and Processes Branch, a program which will provide the necessary statistical information to be used in determination of the need for replacement of equipment. However, the proper analysis of this information is still a very controversial matter. The Bureau of Ships has assigned Mare Island the task of developing a suitable formula for use in evaluating the need for replacement action. Each shipyard should conduct studies and research toward application of

such a formula. It is quite possible that even though the equipment needs to be replaced, the authority or the funds cannot be obtained to do so. However, a proper system will indicate the penalty in inefficiency and excessive maintenance which is being paid because the equipment is not replaced at the optimum time.

It is vital that the means whereby authority and funds are obtained to carry out the procurement cycle be understood. It is noted at this time that a definite improvement in the procedure for authorization of funds has been adopted in that now, whenever a request is submitted for a new piece of equipment, the cost of installation is included with the estimated cost of the equipment. This precludes having new equipment sitting around while you scavenge to find funds to install it. Under Naval Industrial Fund operation, as previously, the integrated priority list of "P," "M," and "C" items must be submitted to the Bureau of Ships for approval. But the funds for acquisition vary with each list after their approval by the Bureau. On "P" items, the Bureau provides a special allotment under which they procure the approved "P" items and ship to the Shipyard. Also, if local procurement is authorized on these, the cost is charged against the same allotment and in each case the cost of installation at the Shipyard is lodged against a Bureau project order. Those "M" items of "recurring" category which are approved, must be financed out of the Shipyard industrial fund with moneys which have been accumulated as an item of overhead expense in anticipation of Bureau approval. The "non-recurring" category are financed as military support. On the other hand, the "C" items are charged to a special allotment outside of NIF provided by the Bureau. If the work on "C" items is accomplished by Shipyard personnel, it

is processed as a customer order just as we would charge any other customer for work. If it is on a contract, it does not process through NIF at all but is lodged directly against the Bureau of Ships allotment. In submission of "P," "M," and "C" items, it is important that the justifications be carefully written to give a full and complete picture of the reasons for the requested item. It is not fair to the Bureau of Ships to provide incomplete or misleading information because for them to judge from a cold piece of paper as to the necessity for the item is a difficult enough task under any circumstances. More than likely, if the justification is not clear, they will turn down the item rather than go through the time consuming process of requesting additional justification. It is well, also, to review justifications on all outstanding items periodically since conditions change from time to time and I have found it desirable to modify the justifications in many cases subsequent to their submission. In order that the Production Department items be given appropriate consideration, the Shipyard integrated priority list, as proposed by Management Planning and Review, should be carefully reviewed and, if unsatisfactory, representations should be made to the Plant Priority Review Board before the priority list leaves the Shipyard. Upon receipt of the equipment, all material defects and defects of operation should be catalogued and reported to the Bureau and to the Supply Department, regardless of who initiated the purchase, in order that an adjustment can be obtained from the manufacturer. Although the Shipyard may not have too much opportunity to control procurement, every effort should be made to standardize on one manufacturer's equipment in a given type of machine tool or facility because this offers opportunities for great savings in spare parts inventories.

Bureau

Verfügungsurkunde

The layout studies and drawings for facilities must be prepared initially by the Plant and Processes Branch. It is desirable that a close working relationship be maintained with the Public Works Department concerning this feature so that duplication of effort is not encountered. Since the Public Works Design Division must review and modify all drawings and specifications to comply with Bureau of Yards and Docks instructions, it is well that they be kept cognizant of what is being developed by Production and that Production only provide such information as will not be duplicated by Public Works. This is particularly true in the case of buildings and structures. It is well to be cognizant of the fact, too, that the process of getting a job finally approved and an estimate made is a slow one because of this very feature. After the Public Works Design Division has spent considerable time reviewing the Production submission, then their estimating group must analyze the job and provide an estimate. A pitfall exists here in that many times the Plant Branch gets in a rush and applies a cost estimate to a job without going through this full process, then when Public Works comes up with their estimate, the cost is much greater, and the Shipyard is embarrassed to have to go back to the Bureau and request additional funds. Another way in which this embarrassing situation arises is that even though submitted with a valid Public Works estimate, this only includes a limited amount of overhead and if it becomes necessary to contract the job out, due to shortage of manpower, the cost will be much greater than that originally expected. Further, when it becomes necessary to contract the job, the plans and specifications must go through an additional time-consuming step. They are again processed, this time through District Public Works. Many times this office will make changes without reference to the Shipyard and go ahead and let the contract, resulting in a final product which is unsatisfactory to the Shipyard. This calls for

close follow-up on jobs that are particularly critical for the Production Department.

The Plant and Processes Branch, on occasion, due to excessive pressure from shop masters might make unwise compromises in plant layouts. Full support must be given to the head of the Plant Branch so that he can provide for a proper layout of facilities which takes into account the long range viewpoint and development of the shop as well as the immediate problems which are of more interest to the shop supervision at the time.

The fact that systematic preventive maintenance of machinery, with periodic overhauls scheduled and carried out, is much more economical and results in better equipment performance has been so well established that I need not belabor the point. However, this does not necessarily mean that such a program is in effect. The current Shipyard directives on the subject should be reviewed and a check made as to the adequacy of the program actually being carried out. It is the Shop Superintendent's responsibility, which has been delegated to Shop 06 for accomplishment, to provide for proper maintenance procedures. On a lathe or milling machine, poor maintenance normally will only mean eventual breakdown, however, in the gas manufacturing plant it may mean an explosion with loss of life and severe property damage.

The question of how much we should spend on maintenance is a difficult one. Currently the figure runs about four hundred and fifty thousand dollars a year. This sounds like a great deal until it is seen that it is only one and one-half percent of the production facilities value, then it appears rather small especially since industry averages about five percent on this item. It should be the aim of the maintenance program to give usage data and statistics to permit better decision concerning this vital matter.

Accountability for equipment is another matter which needs constant attention. Assurance must be obtained that someone has been delegated specific responsibility for each item. Each year when the annual inventory is held for plant accounts there will always be a certain number of items missing and frequently it is indicated that they have not been seen for months. Such reports only highlight the need for year around surveillance of plant equipment records. If losses are reported promptly it is usually possible to find and recover the item. If, however, it is not brought to light for many months it is probable that the item will never be found.

Portable Power Tools

This category of tool is treated separately because of its special problems. They are not of sufficient size and cost to impress people with the necessity for proper attention, yet their poor performance can cripple the efforts of many productive workers. This type of tool is expanding in scope of application constantly so a sound program is essential for proper accountability, maintenance and replacement.

Procurement is normally by local procurement whenever possible. It is in this field where the greatest problem arises on standardization. Due to the provisions of the law that bids must be taken, and usually the lowest bid accepted, each new batch of equipment is of a different manufacture. I have seen as many as fifteen different brands in a group of two hundred pneumatic drills. When we multiply fifteen different brands by the numerous spare parts for each, the value of our spare parts inventory rises rapidly as does the space and cataloguing problems. Consideration has been given to mass procurement by the Bureau with certain brands being funneled to each yard but nothing

has as yet been accomplished along these lines. In connection with procurement, it is necessary that the equipment be carefully inspected upon receipt. It has been well established that we cannot rely upon the Naval Inspection Service to assure satisfactory compliance with all specifications. If defects are not discovered prior to placing in service you are usually stuck with a major rebuilding job.

Control of maintenance on portable power tools is a particularly difficult problem. They are too heavy for employees to be willing to return them daily to the toolrooms for servicing yet a large majority of them need such service. It is necessary that there be either a traveling service facility or several conveniently located fixed facilities if the program is to be effective. A central overhaul facility is mandatory for the periodic overhaul of this equipment in order to take advantage of a consolidated inventory of spare parts and of an efficient and safe cleaning room.

Accountability of this equipment is assured through the tool control program and should present no real problem.

The inventory of spare parts is capitalized as a shop stores for Shop 06. This should be scrutinized periodically to make sure that necessary spares are not dropped because of their slow turnover rate. Special rules must be applied to the stocking requirements here.

Loose And Hand Tools

The inventory value of loose and hand tools approximates five and one-half million dollars, a sizeable sum. Since these tools are considered as expended as soon as they are placed in the toolrooms, it is doubly necessary

that an effective control be maintained over their use and disposition. The Tool Control System is in effect a miniature stock control system, but one which will accept return of used equipment. At present much of the record keeping for the system is done by hand which is very uneconomical of manpower. Steps are being taken to adapt tool issue and return to an electric accounting machine card system so that usage data and inventory records can be integrated together and handled by machines at great savings. It will also permit a more effective reporting system to the Bureau at very little inconvenience.

In carrying out procurement of these tools we have somewhat the same problems of standardization and receipt inspection as we do in portable power tools, but to a lesser degree.

The critical decision which arises in connection with these tools is what constitutes a reasonable back-up inventory. Should it be enough to provide tools until M plus six or longer? Once the decision is made the tool control system can easily implement it. Also, as a corollary, special consideration must be given to such things as carbide cutting tools and diamond grinding wheels. Experience has shown that once a war starts it is almost impossible to obtain additional amounts of these materials so it is well to have a much larger back-up inventory of items in this and similar categories. A systematic program of replenishing the tool inventory is vital. It is easy to economize on procurement for a couple of quarters without seeing a detrimental effect. However, it will show up as much as a year later when you most likely can ill afford to lose productive output.

In order to up-date tool specifications and to standardize on specified requirements the Bureau sponsors a tool testing program in all shipyards.

This is a very important program which must have the personal attention of the Shop Superintendent if it is to succeed. Many times it is difficult to justify the funds used, on the basis of an immediate direct return to the Shipyard, but the over-all long range benefits far outweight the cost to the budget.

Tool Engineering

An area which has not been exploited to any great degree is that of tool engineering. The tool engineer, located in the Plant Branch, is a specialist in the field of tool and die design. His technical knowledge can be a valuable asset to the Production Department if properly utilized.

Many times it is necessary to design a special tool or jig to accomplish an unusual job. Although the tool shop, Shop 06, is responsible for providing the tools or jigs, the tool engineer must be an active participant in the design and evaluation of such items.

There are many areas where this engineer's talents can be used and it is suggested that he be allowed a wide freedom of action.

Building And Space Requirements

The Production Department does not own the fixed buildings it occupies. Instead, all fixed buildings and open working and storage space belong to the Public Works Department who administer them for the whole Shipyard, assigning custodial responsibility to those departments who establish a justification for useful employment of the space or building. The departments using the buildings are responsible for maintenance costs to the buildings and for space improvements. There always arises a question as to what are major rearrangements

or improvements since these costs may be borne by the Public Works Department or by special allotment on occasion. Careful study of the distinction will pay dividends in shop overhead rates. It is my opinion that building maintenance should be in one shipyard wide overhead cost class. Otherwise we find a small shop in an old building (through no fault of theirs) being saddled with excessive building maintenance costs which run their overhead rate too high for competitive pricing of work.

Of course temporary or portable buildings are the property of the respective department and must be built and maintained by department funds. If a system of control is not carried out we will find large quantities of portable buildings springing up all about the waterfront. This becomes a serious problem because in general they are unsightly and also do not meet the safety standards that fixed buildings must meet. So to countenance portables is to run a calculated risk on safety hazards, particularly with respect to fire protection.

Within the Production Department, space assignment in open areas or in buildings is the responsibility of the Shop Superintendent's office. Long range plans should be projected forward and used as a guide. If all decisions are made on a current need basis we will be unable to accommodate the major requirements which occur later without a major expenditure of funds and probable disruption of the operations of one or more shops. Also surveillance of space assignments should be maintained because it is seldom that a shop will voluntarily relinquish space assigned to them even though the need for its use has vanished.

Facilities And Review Boards

These are three items which should be discussed here:

Shore Station Development Board. This is a Shipyard board which is responsible for maintaining and projecting forward the Shipyard requirements in the way of major improvements. The recorder of this board is a key civilian from the Public Works Department. He makes the presentations on the various items and recommends the shipyard priority assignment. The Production Officer is a member of the board and usually takes the Shop Superintendent along as his staff assistant. I make it my duty to obtain the proposed priority list in advance and provide the Production Officer with all pertinent background information on projects of interest to Production. Of course, if the Production Officer is unable to attend, I normally attend for him and represent the department.

Plant Facilities Priority Review Board. This board is a Shipyard board also which is established to review and make final recommendation to the Shipyard Commander concerning the Shipyard integrated priority lists for submission to the Bureau. The Shop Superintendent is a member of this group. Many times this board is allowed to be somewhat dormant and not used. In that event usually Management Planning and Review establishes the relative priorities for items submitted by the various departments. I consider it very desirable that this board be kept alive to bring a broad viewpoint to priorities establishment.

Mobilization Planning. In all the work related to major improvements and to plant facilities and equipment, a careful consideration should be given to coordinating these requirements with those of mobilization. This is not too well carried out normally.

General

The evaluation of tooling effectives is a nebulous thing. Each of us can state how effective and efficient we think the tooling program is but we really have no criteria which we can use to make an accurate evaluation. This is something that all of the personnel of the Shop Superintendent's office should devote some thought to.

Production personnel have long recognized the benefits of having the plans, the material and the labor arrive at the job at the same time for optimum output. Since no productive work can be accomplished without tools we should add a fourth factor, normally taken for granted, that of getting the tools to the job at the proper time. Further it is not enough to get just tools there, they must be the proper and most effective tools. For example, the output of a lathe using carbide tipped cutting tools can be as high as three times that of one using ordinary cutting tools and at the same time the quality of the cut is much better for smoothness, requiring a lesser finishing operation.

In order to improve the collective judgment concerning tooling effectiveness, I suggest three courses of action for a Shop Superintendent and his staff.

(a) Take the time to visit the jobs both inside and outside and observe the facilities in use. Find out what their problems are.

(b) Always attend the Bureau of Ships "Tool Standardization Conference" meetings and take part in all their programs.

(c) Whenever possible attend machine tool and industrial exhibits. Here one gets to see the latest developments in the field.

Reference reading:

Manual for Administration of Facility Programs at Field and Fleet Activities issued by Navy Facilities Branch, Facilities Division, Bureau of Ships, Department of the Navy.

CHAPTER II

Production Processes and Procedures

A Shipyard organization is established for one purpose - "Service to the Fleet." In order to accomplish this: the Planning Department specifies what is to be done (the scope of the job) by means of job (work) orders supplemented by blueprints which automatically establish the material requirements, and the time limitations for the over-all job; while the Production Department is responsible for the time scheduling of the components of the total job including dates of material and blueprint delivery desired, and for the "how" of the job accomplishment. This principle must be clearly understood.

General

With the above in mind it is evident that Production, i.e., the Shop Superintendent, must establish new procedures and processes as appropriate and review and improve existing ones constantly. It is not sufficient to just plug the holes as they develop, rather the staff should be constantly looking ahead and anticipating the problems before they develop. To do this it would be expected that the Shop Division personnel:

(a) Keep abreast of developments in their field in commercial practices.

(b) Keep cognizant of new installations proposed by Planning for use on ships and be ready with the procedure or process needed to carry out the installation.

(c) Review existing procedures and processes for possible improvements.

(d) Conduct research and tests with a view to providing new or improved variations in procedures and processes.

It is well to emphasize at this point a very important feature of this area of responsibility. Although we stress the fact that it is basically the supervisor's responsibility to enforce safety, it is every employee's duty to enforce safety. A safe Shipyard is usually an efficient one. Foremost in the mind of every person who drafts procedures or processes should be the goal of building safety into them. Only by providing safe work procedures and processes as well as efficient ones can we expect the supervisor to enforce safe practices in their implementation.

To highlight some of the situations encountered from day to day I will touch quickly on each of the technical branches.

Plant and Processes Branch

The gas manufacturing plant was somewhat in the situation of "out of sight out of mind" until long needed attention was focused on it by the explosion of an oxygen compressor. This is representative of how not to recognize a problem. The Plant Branch was cognizant of the need for better maintenance instructions and operating instructions but for several reasons had not done anything:

(a) A shortsighted management policy allowed the personnel in this branch to be so curtailed that taking care of the urgent problems kept this job pushed to the bottom of the backlog of work.

(b) Confusion existed as to just who was responsible for the issuance of such instructions on this operation.

(c) The Plant Branch had, through lack of management backing been rebuffed previously when they attempted to improve the situation.

As a consequence of the explosion a thorough and careful study was made of this operation and proper maintenance and operating instructions were issued.

Another example is that of the procedure for steel plate pickling. The old procedure was slow and uneconomical. A study was made and a new procedure developed which was much more effective and which permitted tripling the output of the operation. A new facility was installed to replace the old tanks which were beyond feasible repair and the new procedure implemented. The Shipyard was able to carry out a program of pickling and painting all plates entering the yard. As a consequence the lead time for ordering steel from the racks into the fabrication shop was halved since it was known that time did not have to be allowed for pickling after stubbing out from stock. This is the proper forehanded way for problems to be recognized and remedied.

Welding Branch

This branch has a heavy responsibility. Few pieces of work are carried out in ship construction without utilizing some facet of welding. They must be familiar with the latest techniques on all types of metal fusion processes.

The use of low hydrogen welding techniques were specified by the Bureau for certain types of work. However it remained for a forward thinking welding engineering group to recognize the immense advantages to be gained from more

widespread use of low hydrogen welding. They developed statistical data to prove the savings possible in speed of welding, use of smaller rod for equivalent strength, and improved quality of finished product. They were able to do a selling job to first, the shop personnel and second the management. The savings to the Navy were conservatively estimated as the major portion of a million dollars a year for one Shipyard. This is the type of thinking that must be encouraged in the Shop Superintendent's staff.

Constant review of welding procedures must be carried out to up-date them. Also the Welding Engineer must be in close liaison with the Plant Branch to advise concerning the procurement or rehabilitation of welding equipment.

Laboratory Branch

This branch has a responsibility to the whole Shipyard, not just to Production. From the Production viewpoint however, we expect them to provide current and safe processes and procedures in their field.

Word was received that another Shipyard had developed a superior method for cleaning fuel tanks. The laboratory personnel visited the other Shipyard and studied the procedure in detail. It was found that no appreciable modification was necessary in our procedure since no more advanced ideas were discovered. The point of this is that, no matter how good we think we are, we cannot afford to overlook any chance for possible improvement. We cannot be afraid to go out and study what other people are doing.

The metallurgists must provide assistance to the forge shop in heat-treating procedures and to the foundry in alloying techniques. The chemists must systematize the parkerizing and anodizing processes to insure safety and quality.

The laboratory personnel seeing the value of plastic boats persisted in their research and experimentation even after the Bureau became discouraged because of the excessive cost of the boats. This perseverance and vision paid off and we now have a superior plastic 12 foot and 16 foot boat for general use of the Navy.

Shipyard Industrial Chemicals Committee

Active participation of this group in process formulation is a very desirable aim. The committee was established to maintain cognizance of those processes involving use of chemicals dangerous to human beings (the employees). They should review and concur in all processes of this nature which may be developed.

Recently trouble developed from the adverse effects of fumes from degreasing operations on the employees in the vicinity. The danger of the fumes to operators of the degreasing tanks had long been recognized however, it was thought that a fifty foot radius was a safe danger zone for unprotected personnel.

Several things were developed by this group:

(a) The fumes from Trichloroethylene used in the tanks, being heavier than air, had stayed close to the ground and, even though exhausted outside the building, been wafted some 200 feet into a working area.

(b) These fumes when in contact with a welding arc could break down into components, one of which was the dangerous gas phosgene.

This committee then prepared recommendations for a more valid process instruction and prepared a suggested program of training for degreasing tank operators, all of which resulted in minimizing the safety hazards of this common process.

Conclusion

The possible areas for action are so large that I could not hope to cover them all. However, the cases above are examples in various categories showing what can be done.

Obviously the answer to all of this is for the Shop Superintendent to incite an alert staff to initiative thinking and above all to teamwork.

CHAPTER III

Industrial Relations

The Shipyard has an Industrial Relations Department to carry out the Shipyard Commander's over-all responsibility in this area. However, since the Production Department has eighty percent of the personnel of the yard it turns out that the Shop Superintendent must be fully as familiar with all phases of Industrial Relations as that department is. Of course there are many people distributed throughout the department carrying out portions of the program but the direct responsibility falls to the Administration Branch of the Shop Superintendent's office.

Personnel

The civilian personnel fall into two categories, graded and ungraded. Graded personnel are those covered under the Classification Act and are commonly referred to as IVb or white collar workers. Ungraded personnel are those of the trades not under classification and are commonly referred to as blue collar workers. The dividing line between the two is rather hazy in some areas. Frequently when a blue collar worker is doing work of a semiclerical nature, such as shop work scheduling, the question is raised as to why they are not shifted to a classified status. Of course there is always resistance to this since, invariably, the IVb position will pay less than the ungraded worker is receiving. The other side of the coin is that if the work can be performed by a IVb we should not be paying the extra salary of a blue collar man. Nevertheless the decision is complicated by ceiling consideration. These will be discussed in the next paragraph. It is well here to mention

another category so that no confusion will result. They are IVa personnel who are ungraded or blue collar workers who have progressed to supervisory rank. These include those such as quartermen and leadingmen. The graded workers are paid on an annual wage and the ungraded on an hourly wage basis.

The Bureau of Ships establishes the over-all shipyard employment ceiling and within that total sets the IVb ceiling. It is well to understand the background of ceiling restrictions so that it is known whether it is worthwhile to request a modification or not. Each year budget considerations determine the total civilian employment of the Navy and within that the amount assigned to each Bureau. Independent of this, the graded ceiling is a specific number imposed arbitrarily which must be distributed by the Bureau among its field activities. Since over-all employment is based upon budgeted funds it is seldom that, where the need is justified, additional total ceiling required to do a job is denied. However we are frequently caught in the middle on graded ceilings. Even though we fully justify the need for additional file clerks so that GS-13's, top administrators, won't be filing their own papers, we may be turned down on ceiling increases. Because of this arbitrary ceiling the only way an increase can be obtained is at the expense of someone else. This is also true in the case cited in the previous paragraph where money could be saved by shifting to graded personnel. So, many times it may be a temptation to resort to details or misassignments in order to get a job done. This should only be done as a last resort because it is illegal to carry these people beyond a limited period without Civil Service Commission approval and the Shipyard will be severely criticized by the Area Wage Classification Office or the Civil Service whichever discovers it first, if these regulations

are violated. In summary on this the Shop Superintendent should be cognizant of the division of responsibility. On graded personnel he determines the needed ceiling and recommends to the Production Officer. When he approves, then the Shop Superintendent negotiates with Management Planning and Review, who control the distribution within the Shipyard, for the ceiling approved by the Production Officer. On ungraded personnel the Production Analysis Officer reviews the workload curves and recommends the ceiling required and this is then approved by the Production Officer and the Shop Superintendent must negotiate for the ceiling. In both classes of personnel the Shop Superintendent is responsible for administering the ceiling and staying within it.

Similar to personnel ceilings we find the Shop Superintendent responsible for the supervisor ratios. Here we must really use common sense. The usual thumbrule is, for outside work fifteen men to one supervisor and inside twenty men to one supervisor. What about the laborers where the caliber of personnel requires closer supervision, sometimes even ten to one; or the Shop 99 people where one supervisor must cover a large number of ships, maybe ten to one is not so bad here either. Then look at the inside machine shop where many times a supervisor can handle thirty men effectively. The Bureau has imposed rules that the ratio of quarterman to leadingmen should not exceed one to four and Chief Quartermen to Quartermen one to five. Adjustments must be made between shops and each shop compared against its past record. Where the inside machine shop may be very effective with four and one-half percent supervision it may be that the rigging shop requires seven percent. Incidentally Foremen and Masters are excluded from this ratio

computation. A shortsighted inspection group may get argumentative about the fact that Chief Quartermen exceed the one to five ratio when the Quartermen to Leadingmen ratio is only one to six. Should we increase our Quartermen to escape criticism on the Chief Quartermen ratio? I would say no, that does not make sense. So one must be prepared to show the fallacy of their logic so that the shipyard policy of efficiency and economy may be continued.

The Administrative Branch carries out the work on personnel administration and in most cases this reaches a big volume of routine processing. Nevertheless it is very important that it be carried out accurately and promptly. For instance nothing irritates people more than to be delayed a whole pay period in receiving a deserved raise. There are so many varieties of personnel actions that it is not necessary to list all of them, but I will mention some of those more frequently encountered.

Details

Assigning people to work which is not in accordance with their position or trade description is sometimes used as a means of trying out a man for a new job so that his capabilities can be determined before making a firm assignment. This is often quite desirable. However, when it is used as a subterfuge to circumvent ceiling limitations, too often the misassignment is perpetrated into years and this cannot be condoned.

Loans

The use of loans can be a very helpful device to permit a more stable shop employment level. If a shop were to hire people to accommodate each fluctuation in workload we would be constantly involved in hiring or firing

in some shop. This can be avoided to a great extent by maintaining the shop levels at average requirements and making loans between related trades to meet peak or slack periods. One feature of this which is worth becoming familiar with is that of the effect on overhead rates. The Bureau has ruled that administrative costs such as training, handling bonds, etc., will be borne by the parent shop yet the productive man-hours worked are credited to the shop the workers are loaned to. Thus the overhead costs of a shop stays the same even though they loan out people but their productive hours worked are reduced so the overhead rates will rise.

Calls

The method of handling calls is dependent upon the Production Officer's management policy. It is perfectly feasible to give each shop a ceiling and then hold the shop master responsible for initiating calls as necessary to maintain his personnel requirements. Under such a system there is no need for approval of individual calls by the Production Officer. Because of the newspaper interest in all calls placed most Production Officers feel the necessity for approving each call so they can be fully informed and ready to answer newspaper inquiries. Also firm ceilings tend to keep the department employment well below ceiling unless we over assign. This is because each master will stay well below rather than take a chance on exceeding his ceiling. I believe a more workable arrangement is to give a shop only an approximate ceiling for guidance and have them place calls when they think they need people. These calls would have to be reviewed by the Shop Division personnel assistant to assure that it will not run the department over and then presented to the Production Officer for approval via the Production Analysis Officer for comment concerning shop workload. This ties all the loose ends together.

Promotions

The Shop Superintendent may normally approve all promotions except where it will alter the supervisor ratio or where the new position has not been approved by the Production Officer, in which case they should be taken to the Production Officer with all the background information.

Demotions

The Shop Superintendent may approve a true voluntary request for demotion, one which is initiated by the employee for personal reasons. These are very limited in number and fairly easy to recognize. However, on involuntary demotions the only person who can approve it is the Shipyard Commander. In this connection the Civil Service people insist that a request for demotion is not voluntary, if, for example, a man has been called in and told that the shop considers him incapable of carrying out the duties of his grade and he then requests reduction to a grade where he is capable of carrying out the work. Here they say that management has initiated the action and should properly prefer charges of incompetence and carry through with a normal charge procedure. It is not very good for the man's morale but it avoids situations which may arise with complications. Since the man is permitted to change his mind any time on the voluntary request up until it is carried out, he may at the last minute abrogate his request and thereby necessitate a follow-through with the charge procedure anyway. I would still prefer to see the man allowed this option but apparently it is illegal by present interpretations.

Reductions in Force

All reductions in force must be approved by the Shipyard Commander and in some cases even the Bureau reserves the right of prior approval. Therefore we must be very thorough in our search for means of absorbing the personnel profitably in another shop. Only after it appears quite definite that there are no possible jobs they can be utilized in and that the workload is such that forced leave or leave without pay will not tide the shops over, should a request be made for approval of reduction in force. Of course the requirement is that veterans be given thirty days notice of proposed action. As a policy of good humane practice non-veterans should be given thirty days notice also if at all possible.

It will be well worth a person's time to become familiar with all the ramifications of retreat rights, bumping rights, etc., which are currently in effect. Otherwise a person will be thoroughly confused every time he gets mixed up in reduction in force procedures.

Grievances

Quite often there will be employees asking for a chance to talk with the Shop Superintendent. This is a delicate situation to handle. They shouldn't be rejected before it is found out what they want, but at the same time there is an established grievance procedure which should be followed. Many times it is strictly a personal matter they want to ask advice on. I found the best policy to be available to talk to anyone. Then if it developed that what was wanted should have been a grievance or maybe a beneficial suggestion, I explained to them the proper procedure and ushered them out.

In no case would I take their side against a supervisor, rather I would assure them that I would look into the matter, which I always did. Here again a person must know the masters because if some of them find out a check up is being made as a result of an employee's visit they will give the man a slight "talking to."

Appeals

An employee in most cases has the right of appeal from an adverse action. Every consideration must be given to such appeals. The employee must feel that he has had fair review of his case.

Hearings

As part of an appeal a man will normally request a hearing. Many times the letter received will not specifically request a hearing but just cite extenuating circumstances. If there is any question at all I favor going ahead and holding a hearing. If this is done then there can never be a kickback by the employee that he was not permitted to present his side of the story.

There is no need to have concern over the conduct of a hearing as long as certain basic features are adhered to. Many people panic when it is indicated that a lawyer will represent the man. There is no reason for this since the hearing should be conducted in the same manner. In such a case it is well to review the rights of the employee again so that it will be known when to tell the lawyer to shut up and when not to. In my experience the employee gets a much better hearing if he has no lawyer. This is because with a lawyer present, I tend to stick to the letter of the book but without one many times I lean over backward to give the employee every chance to tell

all his side and many times help him out. Of course there is always the chance the man will be too afraid to speak up in which case a lawyer does help expedite the session.

In conducting hearings one thing is paramount in my opinion. That is that no one is on trial, it is a fact-finding session and no one should feel he is on trial. If the employee comes out of a hearing feeling he has been on trial he will be bitter and probably appeal the case. On the other hand one must be careful not to put the supervisor who preferred the action against the man on trial. In many yards this is the normal result and the supervision throughout the yard decides it is not politic to prefer charges against anyone since they will be the goat in the long run. So, they allow irregularities to continue which cause unsafe practices, inefficiencies, and loafing. This unhealthy condition should never be allowed to develop. The hearing officer can help prevent it.

The answer is to stick to fact finding and use common sense, there is no substitute for it.

Supervisor Selection

A Shop Superintendent should become acquainted with the method of selecting supervisors. The most valuable commodity a Shipyard can have is good supervision. And by contrast one of the masters computed the loss in productive output which would result from an eighty percent effective supervisor. It was several thousands of dollars a year. The present procedure for selection of supervisors is the best available at the moment, but it is still not considered by most people to be completely reliable. Continual study

should be given to this problem in the hope that some improvement can be made. The Bureau is only too happy to explore possible improvements with a Shipyard. A facet of the same subject is the proper selection of personnel for key positions such as branch heads, foremen, and masters. The present selection methods, an extension of other supervisor selection methods, is pretty good but could stand improvement. In any case their effectiveness depends upon how the selection board applies the principles. It must be recognized that these people are important members of management and any one of them is conducting a big enterprise. Therefore if we get a bad or even mediocre one we will pay a heavy penalty over a ten year period of his incumbency in the job.

Trade Cognizance

A dynamic policy on trade cognizance determination can create a very effective atmosphere for trade coordination and cooperation. This makes for a healthy yard. Of course there can be no strikes of government workers but certainly they will not be effective if dissatisfied. I strongly recommend that early in the tenure as Shop Superintendent an officer satisfy himself as to the policies he will follow on trade cognizance and then stick to them. Also, he should establish a cordial relationship with the various craft committees. They do not have to like his decisions but as long as they respect his judgment and feel that he is being as honest as he can they will cooperate. It is not difficult to understand their position and to anticipate their reactions to a proposed action. I have found that in general the workers on the job do not allow trade cognizance to interfere with the speedy accomplishment of the work. Instead they leave the talking and worrying up to

their craft committees. Thus we owe it to the workers to lead the two opposing committees to an agreement which is in the best interest of the Shipyard. Also, I have found that by requesting information and assistance from the craft committee one can learn an awful lot. Although the onus of decision is always up to Production, valuable assistance should be gained from constant consultation with the Chief Planner and Estimator of Planning and the Labor Relations Assistant on Trade Cognizance from Industrial Relations, each of whom has an extensive background in shipyard work. I prefer to have them as advisors in all my conferences on trade cognizance. Always be willing to go look at the job in question if necessary. Another deplorable feature is that often decisions are made in this area on a case by case basis, i.e., putting out the fires as they arise. A certain amount of this is unavoidable but if an effort is made a person can formulate a long range policy and shape decisions toward this policy.

It is of benefit to recognize two troublesome areas.

(a) Supervision and certainly foremen and masters should not be involved in trade cognizance disputes. They are members of management and as such should support management policy for the good of the yard. In some shipyards they have been forbidden to participate as members of craft committees. This not being the case in Puget Sound we will frequently run into such a situation. Some masters seem to feel it their duty to feed information to their craft committees with which to foment disputes. Periodic reassertion of supervision's management responsibility in this matter helps but does not solve the problem.

(b) The craft committees in general want a decision from the highest member of management possible. And even though the military cannot possibly have as much shipyard experience in the trade problems as a senior civilian, the crafts seem to prefer the officers to make the decisions. I would say this is because they can never forget the previous trade training of a civilian and always are afraid of his being biased. And a civilian might well have difficulty in not being biased. So even though we have a civilian assistant well versed in trade cognizance matters there is no use to expect him to settle the disputes. This is bad because each officer in succession creates a pattern of behavior and there is not a continuity from one to the other. My recommendation is to lean heavily on a capable civilian for research and advice and have him present during all discussions so that he can provide some measure of continuity. But in order to keep the trust of the craft committees we must make our own decisions and make it clear that such is the case.

Another feature of trade cognizance work is that of precedent. The usual practice is to hark back to the latest authoritative statement on the matter or related matter, even if it is as old as 1927 as many of ours are, and try to proceed from there. Therefore I say that a Shop Superintendent should not hesitate to issue authoritative decisions himself where the occasion is appropriate. The most important factor in this is to be willing to put a decision down in writing for the record. That is how precedent is

built. Too many members of management seem to be afraid to put things down in writing. Thus everything that follows one of their decisions must be by hearsay and subject to varied interpretations. The result is confusion and further controversy. I find that where a person lives up to his side of it and states his stand clearly there is less misunderstanding. Also the craft committees will be willing to submit their points of discussion in writing prior to a conference so that a person may be prepared to discuss them intelligently. This makes for a much more profitable session for all attendees.

Training

Production spends large sums of money on training of its personnel. If a Shop Superintendent is to defend the money in the budget he must be satisfied that it is needed and being well spent. With the Production Officer being the senior member of the Shipyard Training Committee, the Shop Superintendent must act as his staff assistant to provide him with completed staff work in this area. The Production Officer does not have the time to explore all the details of training so the Shop Superintendent and his civilian Administrative Branch head must gather the necessary information and keep the Production Officer fully informed. In his absence he should be prepared to represent the Production Department. The Production Department has the biggest stake in training so it should be quick to make its needs felt in the Industrial Relations Department.

If the Shop Superintendent and his Administration Branch Head are not on the various training subcommittees he should see to it that they are placed thereon. The Training Superintendent can only render service to Production

after he has been appraised of the desires of Production for training. It is therefore imperative that close liaison be maintained between the Administration Branch personnel and those of the Training Division.

The need for special technical training to supplement procurement of new equipment must be recognized in time to provide trained personnel to operate the machines and tools. If need be employees should be sent to the manufacturer's schools. There are many of these provided free for those interested.

The backbone of every Shipyard is the ex-apprentices scattered through the various key positions. The Shop Superintendent should consult with shop masters occasionally to see if they are well satisfied with their apprentice program. The standards must be maintained high so that being a graduate apprentice means something. During periods of economy thinking one will have a selling job to do in order to convince the masters that they should maintain a good flow of apprentices. They are a drag on the overhead of the shop but are a lifesaver when suddenly we must expand and need a well trained nucleus. One scheme which was suggested and has a lot of merit might be worth further study. Since a large percentage of the shop apprentices move on to other departments why shouldn't the overhead cost of apprentices be on one shipyard wide cost class. Also why not economize and train all machinists for the whole yard in one shop, all shipfitters and boilermakers in one shop, etc.

Now to an area needing a lot of attention, "Executive Development." A Shipyard is big business and as such should have the best trained management possible. We have been slow to provide adequate training for junior management to prepare them to assume the responsibilities of senior management. It appears

vital to me that an effort be made to improve in this sector. Job rotation is expensive but valuable. This and other devices should be used as necessary.

Finally how much should be spent on training? The Comptroller can say to us any day that we have too much budgeted for training and it would be very difficult to show otherwise. There is no concrete way to evaluate training in dollars and cents. But we should always have that question in our mind and scrutinize the training programs very carefully.

Safety

Because such great improvement has been made in safety in the past few years a lot of people have relaxed their vigilance. This cannot be permitted. It must be recognized that there still are many legitimate safety hazards in every shop. We still have a long way to go to a completely safe working environment.

At the same time we must temper the Safety Superintendent's ideals with common sense. We can reach the point of diminishing returns fast if we attempt to carry out every suggestion on safety. It is not good business to spend thousands of dollars on safety devices which would not be necessary if the employees were educated to the dangers inherent in certain operations and were to use an ordinary amount of thought for self-preservation. We have reached the point now where most of the funds spent are to protect the worker from his own inattention or ignorance. A formal policy of disciplinary action against chronic offenders would improve matters considerably. Thus each case might be judged on its merits.

Much of the difficulty and expense can be avoided if the Plant Branch and Public Works are alert to build safety into plant equipment and facilities initially. No one can foresee all possibilities but it could be greatly

CHAPTER IV

Manufacturing and Non-Ship Work

All work performed by Production Department shops, other than that on or for ships assigned an availability at the Shipyard, is under the jurisdiction of the Shop Superintendent. At Puget Sound this is not a major factor since only about seven percent of the productive labor force is involved. This work is designated as manufacturing and the catchall category of non-ship work. With the present national policy of not making something which can be produced commercially, it is likely that this type of work will decline even further. But even though this is a small segment of the shipyard work it is important because it includes such things as plastic boat manufacture and ordnance stock work and is a service to many customers who will judge the Shipyard accordingly. And, this is a troublesome sector because it is a collection of miscellaneous odd jobs which tend to get lost in the shuffle and certainly do not assume the importance to the workers of the work for ships which can be seen right on the waterfront.

Control Features

The work involved in manufacturing must naturally take priority below that of the active ships present for overhaul. However, we must always remember that many of the items are for use by other shipyards on active vessels being overhauled at their activity. So promised delivery dates must be met if at all possible.

The problem of meeting dates has been greatly improved by the use of central scheduling. The manufacturing work is processed and scheduled in

appropriate order along with ship work. Also the Progress Branch assigns certain men exclusively to manufacturing follow-up. Thus the Manufacturing Branch head can work with the Scheduling Branch and Progress Branch to coordinate timely completion of this work. With respect to completion dates, the time required to process it through Supply and ship it to the customer must be taken into account also. It does no good to have a metal joiner door complete in Puget Sound the day San Francisco wants to install it.

Costing of small jobs can be very difficult. Each customer order comes under the provisions of the Comptroller of the Navy instructions concerning over-expenditure penalties. And a mischarge of a few labor hours can over-expend small jobs before anyone receives a control report to warn of the danger. It is essential that the Manufacturing Superintendent work closely with the Analysis Branch where the master deck of EAM cards is maintained and kept under constant surveillance to prevent over-expenditure. Here, when a job approaches a certain money limit, the master card can be pulled out and subsequent charges will be rejected by Fiscal. We then are able to apply charges manually and prevent over-expenditures. The uncontrollable that occurs from time to time however, is that Supply in material procurement for the job will have to pay more than the estimated cost, then when the charges are lodged against the job the cost runs over. Material orders on this type job must be flagged to not expend more than the estimate without prior approval of the Manufacturing Branch.

The Manufacturing Superintendent should review the means of quality control periodically to satisfy himself that good quality work is being performed. It is rather embarrassing to ship a lot of castings to another activity

and have them go on the air with a dispatch that eighty percent of the castings were found to be porous and unusuable during the machining process. It is a saving in the long run to spend a little extra money and over-inspect prior to shipment of work leaving the Shipyard. This means one hundred percent X-raying of castings and one hundred percent inspection of machine work, expensive but warranted, in view of the freight costs of double shipment. This leads to the next major factor which, although a control feature, is given separate consideration for Puget Sound.

Inspection Responsibility

It is a well established policy of Puget Sound that there is no formal Inspection Division in the Production Department. Instead supervision is charged with full responsibility for inspection and quality of product. The supervision of each shop is responsible for the output of that shop. This principle comes under fire each time an inspection group comes around, but I think we have proven to most people's satisfaction that it works in Puget Sound. Maybe it would not in other activities. In any case it provides shop management with more of an incentive to follow the job and review work being accomplished.

Sometimes it may be necessary for a shop to set up its own inspection group. This is the case in the inside machine shop where the volume of work requiring special instruments for checking warrants a special inspection section.

There is one deviation from this inspection principle. Due to the complexity of the electronic installations on combat ships, it was considered desirable to have a double check on the reliability of the system as a whole. Therefore the Design Division of the Planning Department is requested to have

its electronic engineers check a few selected systems on each ship after completion. They report their findings to the Production Officer.

The policy devolves down to one thing; place the responsibility for quality with the people who can do something about it. A parallel situation exists in private industry where most large companies assign the profit responsibility to each of the product division managers.

Damage and Waste

I know of no Shipyard where damage and waste is properly charged by productive shops. The reluctance of shop masters to recognize this factor as a cost of doing business and charge it properly is understandable. They do not want to be the first to show up with heavy charges in this cost class and thereby look very poor in comparison with similar shops. In addition there are no valid criteria for judging what should be allowable as damage and waste.

In the foundry there can always be a certain percentage of poor castings expected. Foundrymen recognize this but other people do not. A customer would be very unhappy if he were told that he had to pay for twenty castings to get fifteen good ones. Yet that is what he does without recognizing it.

In the machine shop we may expect a certain percentage of damage or rejections due to machine malfunctioning and variations in tool wear.

The legitimate expected damage and waste should be computed in and made a part of the direct cost of the job and should be covered by the estimate. However, those resulting from management errors, worker carelessness, or incompetence should properly be assessed against shop overhead.

I recommend that the Shop Superintendent become familiar with this problem and keep his staff working on it until a solution is reached.

Overhead Work

A large amount of overhead work is budgeted for and carried out. This too, falls in the category of non-ship work. This work is primarily under the jurisdiction of the Plant Branch direction and the Administration Branch for cost analysis. Recently agreement has been reached whereby the scheduling of this work is integrated into the over-all program of shop workload by the Scheduling Branch. For this to work a very close liaison between Shop 06, the Plant Branch, and the Scheduling Branch must be maintained. The schedule of plant equipment and facility maintenance work as administered by Shop 06 can allow for some adjustments to fit into the over-all shop workload picture but it must not be delayed excessive periods or it will not accomplish its purpose.

Some shops have a tendency to handle overhead work as a backlog cushion. This cannot be accepted because when a job is strung out over a long period it accumulates numerous unexplained costs which run the price up excessively. In addition many shops think this is a good place to carry excess personnel when workload is slack, particularly if they are doing work for another shop and not their own. These practices must be watched for and controlled. It is wise to increase the level of maintenance rehabilitation work during slack periods, but only if it is planned and the work needed. But even then it must be controlled and not in the nature of making work.

CHAPTER V

Ship Work

All so-called ship work, that work either on the ship or in the shop which is for ships under availability in the Shipyard, is the responsibility of the Repair Superintendent. Although the Shop Superintendent has no direct responsibility in this area he has several staff assistance functions to perform in relation to the ship work in addition to normal overhead functions. Let us review some of these direct support functions.

Trade Cognizance

As stated in Chapter III, the Production Department makes the trade cognizance determinations. One area of this function which needs strengthening is the ability of Ship Superintendents to carry out the provisions of trade cognizance agreements. Often when a Ship Superintendent gets on a rush job he may violate trade cognizance determinations in order to expedite the work on a particular ship.

A Shop Superintendent should offer his services and those of his staff to hold a periodic discussion session with the Ship Superintendents to keep them informed of trade cognizance problems, current controversies, and consequences of violations of cognizance assignments. I am sure that such assistance would be welcome if not made too time consuming.

Work Assignment Between Shops

Here we have a parallel and intimately related subject to that of trade cognizance. The Production Department by determining trade cognizance in effect determines work assignment between shops. Occasionally Planning and

Estimating will request advice on work assignment where they have no prior precedent and no directives from Production on the matter. This is very good because it avoids the Shop Superintendent having to reverse Planning and Estimating on a work assignment after the job order is issued if he should disagree with their decision.

Also, when there is an unbalanced workload between the shops, the Production Analysis Division is alerted to spot jobs that are feasible of misassignment to a slack shop to avoid a reduction in force. When such jobs are discovered the Shop Superintendent consults with the Repair Superintendent and the Planning and Estimating Division and if agreement is reached has the job issued or reissued as the case may be to misassign the work. When this is done a note is added to the job order stating that "This work is administratively misassigned to balance workload and is not to be construed as a precedent for changes in trade cognizance."

In addition, for small assist jobs where one trade has the major portion of the job and is capable of doing the work, the decision may be reached (requires a Shop Superintendent's decision) that the work be misassigned for purposes of economy and a note added accordingly with the same provisions as to trade cognizance as above.

The Ship Superintendents have instructions to carry out the provisions of a job order as issued but on occasion they may conclude that in their opinion work is improperly assigned and arbitrarily shift it around. Or, in order to expedite a job, will have the wrong trade perform the work. It is understandable that they are interested in expediting the work, but such actions can upset months of careful arbitration on your part, so it cannot be allowed. Here, as above in trade cognizance, we should follow, with

the Repair Superintendent's approval, a program of educating the Ship Superintendent to the best course of action and the whys of the policy.

Production Processes and Procedures Implementation

For the most efficient and safe productive work the processes and procedures set up by the Shop Superintendent's office must meet the needs of the shops and the Repair Superintendent. If no instructions are available no one sits and waits for them, the shops improvise and do the job anyway. Thus we are in the position that, if we do not provide the proper service, pretty soon the productive element will ignore us and set up their own procedures and we will not be earning our keep. Thus, close liaison must be maintained with the Repair Division and the shops and every effort made to see that they have in hand adequate procedures and processes. Then by being familiar with the work, if they are being improperly implemented, it is easy to find out why or to invite to supervision's attention what the proper method is.

Special Tools and Equipments

Close liaison must be maintained with the shops and the Repair Superintendent to anticipate needs for special tools and equipments. Only by such forehandedness can there be provided the full service that should be.

CHAPTER VI

Budget Administration

The budget is too often treated like medicine which we don't like, something we have to take because it is good for us. This is the wrong approach. A budget is a plan of action, a cooperative venture with everyone participating. Some misguided members of management might attempt to use a budget as a club over the operating personnel but such a policy is the wrong approach and will eventually rebound to the disadvantage of the whole activity. In conversations with representatives of private industry a few of them report that such an unfortunate incident has set their whole management thinking back by ten to twenty years. By far the majority of them say they could not possibly live without a budget. And, in fact, the most of the companies use essentially the same budgeting principles that are set up for use by shipyards.

If we approach a budget like a navigator projecting forward his dead reckoning position and then take sights along the way to check the actual position it becomes a living document to help us reach our goals in an orderly manner. To use it otherwise is a misuse and demonstrates a misconception of the principles of budgeting.

Preparation Of The Budget

Whose budget? Shall it be the Comptroller's budget? or maybe the Production Officer's? or the Shop's? No, it should be our budget, the Shipyard's budget, the Production Department budget. Budget preparation or

shall we say initial approval (because it matters not who performs the labor of preparing it) should be at the level at which execution will take place. In a Shipyard this is the cost center. In the Production Department we have better than a dozen of these cost centers.

In the Production Department the Shop Superintendent's office has the responsibility for administering the budget. In my opinion it serves no useful purpose to have each cost center set up a budget section. Instead it is more economical to provide central service from the Shop Superintendent's office. There the cost center budgets can be made up in rough and provided to the cost centers for review and modification as necessary. After all there are really not too many variables in the budget that a cost center can control. If we have been providing proper reports to the cost centers they can make an intelligent decision as to the budget submission they are willing to support and defend.

At this point it is well to highlight the importance of one step of the budget formulation process which is seldom carried out. Before an intelligent budget can be made up there must be a flow of information from the top down as to what the objectives are for the budget period under consideration. So seldom does this happen that it is almost a fatal defect. I strongly recommend that a meeting be held of the responsible heads of all production cost centers well in advance of budget submission to discuss the goals. If none have been received the Shop Superintendent should draft some from his knowledge of the over-all Shipyard policy, and play by ear if necessary. He should tell the people whether the aim is to operate at a twenty percent economy of personnel during the next budget period. Or maybe he anticipates

a rapid rise in activity. Two figures which must be supplied by the Production Officer are the over-all personnel ceiling and the number of productive employees needed. The whole budget must be built around this base. We should make use of their knowledge and vision also. When done with such a session they should all know pretty well what they are shooting for.

Of course after consolidation of all the production facts into the Production Department consolidated submission we will have to sell it to the Comptroller. Above all we must know the facts and not hesitate to defend our budget. And if a cut is made the cost centers should be advised; we can't leave them in the dark. We must make sure that everyone knows what the final approved budget is and what his slice of the pie is.

Execution of The Budget

Now we have the approved budget, let's not lay it in the bottom of the drawer and forget it like too many people do. We must live with it and check up on how we are doing from week to week. Many times we will find toward the end of a quarter that that project we so stoutly defended has not even been started yet. Oh, the plans were not ready when it was submitted. This reflects poor planning and should not happen. Next time before we sell a project we will be sure we have the plans ready. I have found it a good practice to budget for and issue funds in one quarter for material procurement and prefabrication and then the following quarter cover the completion of the project.

In order that the cost centers won't need to keep books, I make sure that the reports from the Comptroller's Department are timely and useful. If a cost center head is provided a good readable status report weekly in a form

facilitating comparison of predicted to actual performance, he can get the whole picture at a glance and won't need to maintain costly records.

A budget must not be an ironclad document which cannot be altered. It must be adjusted to fit the needs and facts of the situation as they develop. Budget administrators must feel free to come back for adjustments. Of course major variations must be reviewed and understood which brings us to -

Budget Analysis

The budget is not the answer to all problems but it is a pretty important document. One familiar with the budgeted operation can by review of the actual performance in comparison with the predicted usually tell the ills of the particular cost center or activity. These figures tell a story to a trained man.

Our staff should become proficient at analysis and keep us fully advised. There is no need to wait for the Comptroller to air our troubles for us.

Many people make a mistake by not understanding the differences between a process shop and a productive shop. It is worthwhile to sit down and learn about the differences in budgeting for the two and in their overhead rate determination.

Certain cost classes of all budgets always receive close attention. A few are discussed here.

Training

As mentioned in Chapter III we really have no criteria to determine what is the proper level of training. We can always be prepared for a rough time because of that. My only advice is to try and show that the training is needed and not just "training for training's sake."

Damage and Waste

We probably can never get true costing here but certainly we should be prepared to admit that a figure like two hundred dollars a quarter for Production is ridiculous.

Time Allowed

Something which we must continually preach on if we hope to have any semblance of true costing.

Travel

It is hard to evaluate travel just as it is training. But a person need not be apologetic about a big budget for travel. Unless we get our people out to see what other activities are doing they lose initiative and get in a rut. They need a certain amount of broadening to keep them on their toes.

Under Five Thousand Dollar Projects

Although distributed through many cost classes, I put it here because these usually come under close scrutiny. It is difficult to decide what is essential in this category. We cannot reduce them to a return on investment basis like business does but we can approximate it. This area could stand improvement.

Cost Accounting

Cost accounting is a factor in budget execution and analysis so I will discuss it here. All our efforts at budget review and analysis can have no meaning unless costs are charged properly. There is of course a full

set of definitions listed for the cost classes. The trouble is that words mean different things to different people. Quite often heated arguments develop over proper charging because of the way the cost class definitions are interpreted. Whenever such doubtful areas are discovered we should make a determined effort to have the definition clarified and if we can't then issue the Production Department interpretation so that all our cost centers will be treating it in a similar manner.

The job order system is so designed that if proper charges are made we will receive in our reports from the Fiscal Division the return costs on each cost class for each cost center. Further with the use of job order supplements, where Puget Sound can use eleven digits on the EAM cards, we can break cost classes down to get almost any detail we wish, all by machine. This must be kept in mind when the need arises to isolate costs on a particular unit.

Budget Reports

Although it is dependent upon the desires of the Production Officer, it would be desirable that the Shop Superintendent prepare and provide periodically an informal report of budget performance. This would be a means of keeping all hands appraised of the changing factors entering into the budget. Such a report, if written, should be given to the cost center heads also.

And of course there are the reports from Fiscal which should be reviewed periodically for adequacy.

Overhead Rates

Since such a large part of the bill to the customer is overhead charge and directly related to the overhead budget execution, the Shop Superintendent

should become familiar with how these rates are determined. The rate computation for productive shops is not too difficult to comprehend but when we start looking into the process shops it will be found that only a limited few understand the costing methods used here. So if the time is taken to learn about these one can eliminate one more murky recess of the budget picture. I was only able to find two people in the Shipyard who would attempt to explain the procedures on process shops to me and one of these had limitations.

The rates can shift radically if no long range plan of administration is followed. The rates are computed and set by the Comptroller's office but the Shop Superintendent is vitally interested and must be cognizant of the procedure step by step. An example of one type of thing to be on guard against is the distribution of charges against a shop for plant facility improvements. Particularly when the work is done under contract, the charges may be assessed against the shop in one lump sum. Thus the overhead rate will skyrocket. The proper approach should be to start accruing funds in anticipation of the charge as soon as it is authorized for accomplishment. Even this may not spread it sufficiently to keep the rate reasonable so, on occasion, it can be amortized over a five year period. With major outlays of funds this is the only sensible approach so that the overhead rate for the particular shop will not be completely out of line. It must be recognized, however, that the Comptroller is expected to balance the over and under absorbed conditions of the shops so that he approaches a break-even point for the whole Shipyard at the end of the fiscal year. Thus the Shipyard overhead rate is not affected particularly by the spread of costs in one shop, instead in effect the other shops are subsidizing the particular shop for a period of time. This

procedure is almost the only way we can afford improvements in shops such as the forge shop where the plant value is extremely large but the number of productive workers is very small.

Reference reading:

"The Budget Comes of Age" by James Pierce
Harvard Business Review issue of May 1954

CHAPTER VII

Administrative Services

The Administration Branch is responsible for another important function, that of management engineering. Few people realize that the benefits of management engineering can only come from study and application of it at the lower levels. There must be someone to work with the lower levels of supervision to guide them in appropriate applications of scientific management. This is the guiding precept of the Administration Branch in this work.

Administrative Methods and Procedures

This category of endeavor is concerned with methods and procedures used in office work including all paper work. It has long been recognized that a scientific study and analysis of the office practices can yield great benefits in simplification of work patterns and improved efficiency. It is obvious that people given a job to do will accomplish it in some fashion, but it may not be the most efficient fashion. No activity ever reaches full efficiency in this field and even if they did it would have to be followed up constantly because new people entering the group will introduce their own methods which should be reviewed as time goes on. Results of studies in this field may even entail office rearrangements to attain the indicated objective.

Forms and Reports Control

This category is very similar to the previous one and sort of overlaps. Forms and reports control is normally thought of as the review of the papers for proper format and ease of filling out, etc. This only scratches the surface. I was briefly indoctrinated in the broader aspects of this subject by

the personnel at Puget Sound and have since read a few references on it.

A form or report isn't just a piece of paper, it represents several office procedures and methods. The filling out of a report is intimately tied in with the practices being followed in the particular office. A poorly designed report may be forcing inefficient and cumbersome practices on an office unit.

If a forms and reports man is to carry out his duties properly he should prepare a process chart on each new form presented for approval in order that he can follow the devious path the form may travel during its use. This of course is in addition to the study of format, ease of printing, etc. By this means it would be easy to highlight changes required in the form to provide for a more efficient procedure of handling. Of course the organization and methods man is concerned with the remedial action required here and must be consulted.

As might be suspected, shortage of personnel will not permit this rigorous treatment of forms and reports. Instead only the more important ones get the attention they should.

Forms and reports control appears as a bottleneck and hindrance to most people, but to management it should be a tool for more efficient operation. For it to be so, the control group must be adequately staffed so that they can do a complete job.

Organization Maintenance

If the lines of authority and responsibility for an activity are clearly delineated with an organization chart, normally the major hurdle of management

is covered. It is true nevertheless that people fill in the organization and personalities being what they are they may prevent optimum functioning of the activity or unit. It is the job of the Shop Superintendent's staff to obtain the cooperation of all elements of the Production Department in maintaining the organization charts current with actual work assignments. Many times changes are made in work assignments which in effect change the organizational structure without reference to the charts and the Shop Superintendent. First, the Production Officer must approve all changes in organization, and if important enough it may have to be approved by the Shipyard Commander and even the Bureau of Ships. Second, unless the charts are kept current, reflecting the true conditions, the personnel involved may become confused and their efficiency suffer from lack of a clear-cut assignment of duties. So it is well to periodically impress on all levels of management the necessity for careful study and review prior to organization changes.

Work Standards and Work Measurement

Frequently as soon as we mention this subject people get up in arms and start arguing. No one likes to be measured. This subject is one that people spend years studying so it is unlikely I can cover it in a few paragraphs. However, I will set down some of my thoughts on the matter in order that I can highlight certain features and emphasize its importance.

When it comes time to justify the personnel ceiling it is impossible to prove how many people we need to do a job unless we have practiced work measurement and established some sort of work standards. How simple it would be if we were able to compare our workload and backlog with the valid work

standards and compute the manpower needed for the job. I have always had to base my personnel requirements on judgment and anyone can challenge the accuracy of such a statistic. On productive work a certain amount of historical data has been developed and the estimates of labor required on jobs which the production analysis group consolidate into productive labor requirements are in general very good. But on overhead personnel and particularly the graded personnel, we have no valid means of analyzing the workload to predict manpower requirements.

Since greater pressure is applied each year, at the national level, on manpower requirement justification it is natural that this type of thinking should be reflected at the shipyard level. Thus we are faced with developing some valid means of showing the need for every employee on the payroll. I cannot emphasize too much the urgency of the Shop Superintendent starting a program which will generate such information.

Of course as a result of work measurement we should be able to set up standards. There are two kinds of standards:

(a) Statistical standards which are based on historical information of past performance.

(b) Engineered standards which are obtained by a detailed analysis of each step of an operation with stop watch timing resulting in a final determination of the standard by engineering evaluation. Standards do not have to be prepared on an individual basis, they can be by averaging group performance. Although engineered standards are usually more accurate, they are not

worth the extra expense except in large volume operations such as automobile manufacture. Instead we can accept and use statistical standards and be sufficiently accurate for our needs. Any kind of standard is lacking in practically all shops and offices. They should be developed.

Performance Evaluation

A field of great confusion is that of performance evaluation. At present it is strictly a matter of opinion. This is what makes personnel actions so difficult. We have such a vague means of evaluating performance that it is no wonder that we can't tell an employee that he isn't doing a satisfactory job and make it stick. This subject is directly related to the preceding paragraphs. After all "standards" is just the short version of "standards of performance" and "work measurement" a part of "measurement of performance." Thus we can see that if a system of work measurement and work standards were to be instituted for graded personnel as well as ungraded we would have the invaluable tool for personnel evaluation. Then when a personnel action becomes necessary we could have facts to base our charges on, not opinion.

One shop of the Shipyard as early as 1953 had developed and placed in use a very good system of statistical standards based on group performance. In addition this had been utilized to foster a competitive spirit between groups thereby increasing productive output. Elements of this system plus additional features were being used to evaluate the lower levels of supervision. If programs of this nature can be extended to all elements of the

Shipyard it is hard to see how any other Shipyard could hope to equal the performance of Puget Sound.

I am afraid it will be up to the Shop Superintendent to initiate a program for graded personnel, however. There is too much pessimism on the part of everyone concerning the possibilities of finding suitable yardsticks for paper work to expect spontaneous adoption of a work measurement system.

Mobilization Planning

Though this is not properly a part of this chapter, for lack of a better place I will touch on it at this time.

Typical of most management, few members of shipyard management ever take the time to sit back and plan for the future. They are always too engrossed in current operations and too understaffed to devote any time to such things as mobilization planning. When prodded into it they make a one shot try at mobilization plans and then hope they never see them again. Of course we all recognize this as being wrong but what can one do to overcome the inertia involved.

Someone has to bring the unpleasant work up and I am proposing that the Shop Superintendent is charged with this responsibility. The head of the Administration Branch has been designated as the Production Department representative for this work. He cannot do all the work by himself. All he can do is coordinate the preparation of the over-all Production Department plan for mobilization. This then must be reviewed periodically to maintain it as

a current document. It is the duty of all members of the department to advise of any changes which should be made as soon as they are known and they should be reminded of this responsibility from time to time.

Conclusion

In conclusion on management engineering it is my opinion that the Shop Superintendent is the individual in the Production Department who should lead and arouse the responsible civilians of the department to practice scientific management and then give them every assistance possible, through his staff, in the implementation of improved management.

Reference reading:

Systems Analysis for Effective Administration
by Norman Barish - Funk and Wagnalls

CHAPTER VIII

Miscellaneous Services

The Shop Superintendent's office as a service organization stands available for all miscellaneous functions which no one else will claim. It would be difficult to even list all of them because they are so voluminous, however, I will discuss a few of the mainstays.

Inspections

There are many kinds of inspections called for and in process at all times.

The monthly inspection by the Masters Safety Committee is a Shipyard group but it generates a report which is ninety percent Production Department problems. The Shop Superintendent's office must maintain a check list to see that all pertinent items on the report are reviewed and either remedial action taken or a satisfactory reason recorded as to why no action is being taken. Unless a systematic approach is taken on this, some of the items will be overlooked and recur later to embarrass the department.

The Shop Superintendent has the responsibility for housekeeping in all areas and buildings under the Production Department jurisdiction. This means someone must inspect them occasionally. We can hold the activity utilizing the space responsible for its proper security and housekeeping, but we still must check it from time to time. So in order to serve two purposes, (a) to provide needed inspecting manpower and (b) to give familiarization and training to new officers, the Repair Superintendent and Shop Superintendent jointly approve a schedule of inspection of Production Department spaces by

junior officers of the department. This schedule is prepared by Code 351. If the areas are not in good shape, we will soon hear about it from either the Production Officer or the Shipyard Commander so it is desirable to ride herd on this project.

The Rigging Shop is responsible for making certain inspections of all craft assigned to the Production Department. This procedure should be audited on occasion to determine its efficacy.

Space Control

The job has been delegated to Code 351 to exercise control of all space assigned to the Production Department. In addition he has the job of Pier Superintendent. He is assisted by a member of the Plant and Processes Branch. All space and buildings for the Shipyard are assigned by the Management Planning and Review Officer. And it is our job to support our assistant, Code 351, in two directions. First, in making representations to Management Planning and Review for additional space when needed. Second, in selling the Production Officer on major reassignment of space within the department as the need arises.

When contemplating space assignments, one must take into consideration the long range facilities program and the shore station development program. Otherwise we will find ourself moving shops into and out of buildings and space every few months, a very uneconomical practice.

As mentioned in Chapter I, an activity seldom will voluntarily give up space. So we should initiate a space utilization study by our staff on critical areas and buildings to assure that they are being used to the

greatest benefit of the whole department. This, of course, makes people unhappy but if we are fair in our evaluation and really have a higher priority need for the space, they will soon cooperate with us. For convenience, the Shop Superintendent should have a large map of the Shipyard marked up with space assignments so that he can constantly refer to it.

Beneficial Suggestions

This is basically an Industrial Relations type function but it is something that everyone must take an interest in if it is to yield worthwhile gains. Statistics prove that the program more than pays for itself. However, this is hard for people to remember when it comes down to the drudgery of reviewing and commenting on the great volume of the suggestions that pass through Production. As has been stated many times, for the program to be effective the suggestions must be processed quickly, they must be given honest consideration, and the suggestor must be advised of the disposition of his suggestion. The major roadblock is the speed of processing. Most people will leave the beneficial suggestions till last and they never seem to get around to them. About the only thing we can do is issue periodic propaganda on the subject and check the route sheets on each suggestion to find out who the bottleneck is and explain the necessity of speed to him.

I found that it was a good idea to route the suggestions to the head man of each Branch because many times he could determine by inspection that there was no merit to the suggestion and so comment at once thereby saving a lot of time and avoiding having his staff spend a lot of research on the problem.

Someone must be prepared to assume the guidance of those suggestions which appear to have possibilities of real value. Quite often if the suggestion requires expenditure of funds to develop it, the easy course of action is to allow it to die. This must not happen on worthwhile projects.

The Shop Superintendent has a permanent member on the committee that makes the final review and award on suggestions and by this means can keep cognizant of important suggestions. One thing that always perturbed me was the fact that sometimes everyone will recommend a suggestion highly and it will be approved and an award given then, after only casual application, it will be discarded. In order to avoid this it might be well to maintain a log of those important suggestions pertaining to Production and run a check occasionally to see how many are still in use.

Longevity Pins

In accordance with the current policy being applied, the Shipyard Commander presents forty or more year pins and conducts retirement meetings, the Production Officer presents thirty year pins, and the Shop Superintendent or Shop Masters handle all those for lesser service. Of course, this may be altered from time to time to fit circumstances.

The only point I wish to make is that it becomes awfully easy to get into a dull routine on these presentations. An effort should be made to keep them interesting and meaningful because here is an ideal opportunity to give a morale boost to the people concerned.

CHAPTER IX

Relation To Other Staff Groups

The basic relationships between the Shop Superintendent's office and other staff activities of the Shipyard were indicated in the introduction. However, I consider it necessary to discuss some of the relationships where we are likely to find conflict or duplication.

Inter-Departmental

Management Planning And Review

This department acts in a staff capacity to the Shipyard Commander and renders assistance to the various departments when requested. Their responsibility is to review management and industrial engineering functions from a shipyard viewpoint and advise the Shipyard Commander of their findings. And it is in this area that conflict sometimes develops with the Shop Superintendent's staff. On occasion they may make an independent analysis and decide that Production's justification for an "M," "P," or "C" project is not valid and arbitrarily reject it. Such is <u>not</u> their prerogative. They may recommend as they see fit but only the "Plant Facility Review Board" can delete an item and then the final decision is the Shipyard Commander's if the Production Department appeals the deletion. On matters of shipyard wide interest Management Planning and Review can conduct studies and make recommendations, however on a matter exclusively the responsibility of one department they should not engage in such a study unless the department head is consulted first or possibly the department head may request their services

for such a survey. Thus if Management Planning and Review should make a survey of the machine shop tool arrangement and decide that it should be rearranged they would be out of order. That is the responsibility of the Plant Branch. Of course if there is obvious difficulty and the Production Department refuses to do anything about it that is another matter and, as the Yard Commander's staff, they should invite it to his attention. So we find that the division of responsibility somewhat depends upon the working relationship established. On the other hand on forms control the authority has been delegated to them to act for the Shipyard Commander so there they can render a decision. From this department, in general, we may expect a review and recommend type of function.

Public Works

The Public Works Department parallels and duplicates many functions of the Production Department, specifically the Shop Superintendent's Division. For example; Production overhauls internal combustion (including diesel) engines for marine installation and in some cases for fork lifts, Public Works overhauls gasoline engines for automotive equipment and diesel engines for cranes and trains; Production has an extensive joiner shop and carries out all milling and cabinet work for Public Works, while Public Works maintain a fairly large carpenter shop of their own and repair or rebuild cabinets; Production has all temporary facilities installation work and builds portable buildings, Public Works builds all fixed structures and installs all fixed equipment attached to a building; etc. It would be extremely helpful to have the Plant Branch prepare a tabulation of all such cases and keep adding to it

as time goes on. This would make a very convenient reference sheet. Controversy which may arise between the two parallel groups is normally a management decision since usually the disputing personnel all belong to the same union and it is not a trade cognizance matter.

Also a dispute may arise between the Plant Branch and Public Works Design personnel about plant equipment installation plans. To improve the structural problems Public Works will want to shift a machine around but this will pose a work procedure problem for Production. Unless the cost is radically different the Production desires should take precedence since efficiency of productive work is the whole aim of any installation.

It is also noted that because of the parallel trades in these two departments it is very feasible to loan personnel back and forth between the two departments to take care of variations in workload.

Intra-Departmental

The relationship of the Shop Division to the Repair Division was discussed in some of its phases in Chapter V. I would like to try to delineate the division of responsibility between the Shop and Production Analysis Divisions here. The majority of each division's duties are quite clear but in the areas of organization, procedures, work standards, and forms and reports we find interlaced responsibility which is very confusing. An attempt was made to clarify the situation with revised Shipyard Regulations which the Bureau of Ships approved in June 1954. I will try to explain the distinctions between the related functions.

(a) The Production Analysis group has no responsibility for productive processes and procedures, this is the duty of the Plant and Processes Branch.

(b) The Production Analysis Officer has complete technical responsibility for production planning and control and its installation in the shops which means that he shall

(1) Develop office methods and procedures wherein they apply to shop planning and based upon information generated by the program.

(2) Determine the need for, and delineate the contents of forms and reports used in the shop planning and production control program.

(3) Recommend the necessity for and establish a relative priority for office equipment required in the implementation of the program.

(4) Recommend the necessity for and establish a relative priority for personnel required in the implementation of the program.

(5) Furnish guidance to the shops in administration of production planning and control program.

Now the Shop Superintendent has responsibilities in each of these instances too, so he shall:

(1) Retain over-all department responsibility for office methods and procedures. In this one area the

development is a technical responsibility of the Production Analysis Officer but he may in practice actually request the assistance of the Shop Superintendent's staff to develop them to his technical specification. In order to avoid duplication of trained personnel this is probably what will occur and certainly will be more economical.

(2) Retain full departmental responsibility on forms and reports control. But in this area after being appraised of the need for certain forms and what they should contain, he will have his staff develop the necessary forms which meet these technical requirements of the Production Analysis Officer.

(3) Retain full departmental responsibility for provision of office equipment to any production facility. But in this area he will accept the requirements and the relative priority of requirements established by the Production Analysis Officer at face value and attempt to provide it in relative priority with the other requirements of the Production Department for office equipment.

(4) Retain full departmental responsibility for personnel administration and ceiling control. But, in this area, shall take the Production Analysis Officer's

recommendations as to personnel and priority of need and fit them, at face value, into the over-all Production requirements.

(5) Carry out his responsibility for staff assistance to the shops in all administration and organization work. But he shall make use of technical guidance of the Production Analysis Officer in changes and practices related to the production control program.

As I understand this relationship the Shop Superintendent is a service function for the whole of the Production Department, including Production Analysis, and has an added responsibility of performing those services related to production control and shop planning to the technical satisfaction of the Production Analysis Officer. This is no different from an existing relationship of long precedent where Production must perform ordnance work to the technical satisfaction of the Ordnance Officer. And if duplication of personnel is to be avoided for economy of operation, there is no justification for the Production Analysis Division to employ organization and methods examiners, forms specialists, office equipment specialists, personnel technicians, and similar personnel already available in the Administrative Branch.

(c) The Production Analysis division has interest in shop standards, performance data, etc., for one purpose and that purpose only. This interest is to be able to predict manpower requirements to accomplish a given workload, manpower

allocation for scheduling purposes, and shop productive effectiveness for labor estimating purposes on job units, all being resolved to one thing "manpower utilization." Thus they are expected to:

(1) Take information generated by production control programs and develop and maintain data on productive effectiveness of the shops so that they can predict the productive output of the shop at various levels of employment.

(2) Assist the shop planning personnel in the review of their records and the development of standard estimating data for job units as based upon shop averages, this data to be used in shop planning work and as required in the whole production control program.

(3) Take these shop standards developed by the shops and develop over-all production job standards for planning, scheduling, and estimating future work. This data will be kept as a library of standards and will be made available to Planning and Estimating also.

By contrast the Shop Division is responsible for work procedures and processes, work measurement, and performance evaluation. So, in a parallel listing they can be expected to:

(1) Assist the shops in developing performance standards with which to evaluate their efficiency and personnel. These standards will in general be based upon group averages for a given type of work. Upon development of standards, assist the shops in analysis and recommend means of improving the performance.

(2) Assist the shops in establishment of job work units lending themselves to accumulation of data to establish valid shop standards. Conduct work measurement studies in conjunction with shops as necessary to this program.

(3) Work with the shops in the review of work practices, procedures, and processes to assure the most effective work output is being provided for.

In all of this it can be seen that the Production Analysis Division takes the data generated, accepts it and makes use of it as in a technical manner whereas the Shop Division with management rather than technical responsibility must find out the why and proceed to improve the productive efficiency by working with the shops. The Shop Division must assist in the oiling of the gears that grind out this statistical data.

(d) The Shop Division must take the data generated both inside and outside of the production control program and work with the shops in its effective application to personnel administration. Herein enters the individual employee evaluation, group performance efficiency, and supervisor evaluation.

Conclusion

Reviewing this whole chapter it is evident that there is a close intermeshing of responsibility within the Production Department and closely related, if not overlapping, areas of responsibility between certain departments. The only way that the Shipyard can attain maximum benefit from the operation of these groups is by special effort being expended by each to correlate and cooperate on all their related projects to assure successful accomplishment.

CHAPTER X

Shop Superintendent's Organization

The Shop Division has responsibilities of considerable magnitude as we have seen from the preceding chapters. In order that these and other assigned duties be discharged in a commendatory manner, it is essential that the Shop Superintendent's office have a sound, well planned organization and that this organization be suitably staffed.

Organization

Since the basic organization pattern is sound and has been proven to be satisfactory in operation there is not too much need to dwell upon possible changes. The Branch heads will invite attention to discrepancies in organizational structure where they find the need for change. The Welding Branch and the Plant and Processes Branch have a very satisfactory organization. The Administration Branch had some areas where the delineation of duties was not too clear and successive adjustments have been carried out to clarify this. The Laboratory Branch has an organization which needs attention. The normal lines of authority that should exist have been distorted to fit personalities. This has resulted in too many people reporting to the Branch head. As time goes on, a more logical organization should be adopted and implemented on a progressive basis. The Manufacturing Branch is not staffed with civilians so it poses no organization problems.

There is one organization question mark that I should discuss the pros and cons of, that of a Senior Civilian Assistant Shop Superintendent. The

organization as it is now set up does not provide for such a position. This has been the case since 1949 when the Bureau of Ships settled upon a standard organization for the office. At that time the decision was made to eliminate the position, however, exceptions were allowed for a few yards in order to avoid demoting the civilian in the position at the time. The intent was that as the specific individuals retired or moved to other jobs the position would be abolished. Actually this has not been completely carried out and there are still a few Shipyards having the position.

Now let us consider the advantages of having such a position. Officers come and go in the job of Shop Superintendent and each establishes a new set of operating principles generally at variance with the previous occupant of the job. And, unless the officer is in the job at least a year, he never gets to know what his responsibilities really are. Therefore, most of his first year is spent learning so that he can contribute something to the organization. We can say then that the continuity is not very good and actually for a series of periods there is very little coordination exercised by the head of the division. Next the officer has to become familiar with the problems of five different branches in order to perform his duties properly. This is difficult to do in the normal period of two years that an officer may be in the job. If we have a Civilian Assistant Shop Superintendent he is at the top of the grades he may hope to reach in a Shipyard and should therefore expect to stay in the job for a lengthy period, ten years or more. This would provide for strong continuity of operating policy and coordination of the five branches. The officer would have an experienced man to receive

advice and guidance from. With such a long period in the job the civilian would be able to personally become familiar with every phase of operation of the office and therefore have a wealth of knowledge and be an invaluable asset to the Production Department.

Then let's take a look at the disadvantages. The major one is that the condition might develop which had developed in several cases in 1948. The civilian because of the very fact that he is in the job for a long time tends to forget his staff capacity. He soon feels he can replace the Shop Superintendent and even assumes the line authority of the Production Officer. In a very short time thereafter the shops, not being receptive to dictation, begin to ignore the Shop Superintendent's Office and the office begins to operate in a vacuum with no one using their services. The morale of the organization is ruined because the shop masters exclude them from the shops. This situation becomes progressively worse until a strong Shop Superintendent or Production Officer clarifies the civilian's thinking or possibly even demotes him. As an aftermath, it may take years to bring the organization back into shape and back into the good graces of the shops that they are there to serve. Anyway, looking at it seriously, why should an officer need a special civilian assistant. He should be able to exercise management over five branches himself. And, if he has been chosen for the job with experience in mind, he should have no difficulty comprehending the operation of all phases of the operation. If such a position is set up we may be in the situation of paying for another permanent position which is not really necessary. Further the civilian branch heads can provide continuity just as well as, if not better than, one man.

So, should we have a Senior Civilian Assistant Shop Superintendent? I think it depends upon the policy of the Shipyard on selection of Shop Superintendents. If they expect to consistently select well qualified officers for the job then no special civilian assistant is needed. If, however, they intend to rotate officers through the billet in rapid succession without giving too much consideration to experience, the use of a senior civilian is almost essential.

Staffing

No matter how good our organization is we won't get results unless we staff it with competent personnel. The shortage of technical personnel throughout the country is becoming critical. It behooves us to create a climate in the Shop Division which will induce competent personnel to join and remain in the office. The proportion of staff personnel in the Production Department to the productive workers is much less than in similar commercial industries. Therefore, if we are to operate like civilian industry and be in competition with them our staff personnel must be more effective in their jobs.

In particular I note that most Shipyards are lacking in industrial engineers and management engineers in their Shop Superintendent's Offices.

Reference reading:

Developing Men for Comptrollership
Harvard University Printing Office - 1950
by T. F. Bradshaw

Reaching Out in Management
Harper and Bros. 1953
by Given

Development of Executive Talent
American Management Association - 1952
edited by Dooher

Middle Management
Harper and Bros. - 1949
by Mary C. H. Niles

CHAPTER XI

Comptroller Of The Production Department

After much reflection I decided that it would be appropriate to put a chapter into this dissertation concerning the analogy between the two important staff organizational responsibilities, the Shipyard Comptroller and the Shop Superintendent. The comptroller function has been thrust upon us with such suddenness and fanfare that most people do not realize that it is just a collecting together of several important functions under one head and clothing them with refurbished statue. These functions have been performed for years but were dispersed among several groups.

It is my opinion that the Shop Superintendent performs for the Production Department, the major component of the Shipyard, the majority of the functions performed by the Comptroller for the Shipyard and many more in addition, making him in the truest sense analogous to a "broad gauge" comptroller as so often cited in industry as the ideal concept.

In support of this opinion I would like to review various statements of policy concerning this concept and the broad functions listed for it by the Secretary of the Navy in a directive of November 1953 and show how the Shop Superintendent can be fitted to them.

Basic Concept. . . . new elements introduced by current concept. . .:

1. Emphasizing the constructive aspects of the reporting, analysis and interpretative functions as distinct from the purely recording function.

2. Improving budget formulation and execution through the collection and utilization of accounting and program data at all organizational levels.

3. Coordinating and integrating the several comptroller functions to provide concisely to the commanding officer the basic data essential for efficient, economical, and effective management.

All three of these apply equally as well to the Shop Superintendent's staff functions. Each branch head is responsible for reviewing reports and information gathered from the Production Department in his area and for interpreting to the Shop Superintendent and Production Officer the meaning of the variations from the standard or past conditions or performance. In budget formulation and execution the budget group of the Administration Branch has over the past several years built up data in such a manner that it can be used in the projection of proposed programs and evaluation of current budget execution. The job order system used for overhead expenses, recently modified to fit the industrial fund, permits accumulation of accounting data in a form readily usable to management of all levels. Coordinating and providing to the Production Officer basic data for efficient, economical, and effective management has long been the duty of the Shop Superintendent and his staff.

Coordinated Staff Service. . . . the fully coordinated staff service provided by the comptroller should relieve the commanding officer of much of the burden of detailed fact collection, coordination, and analysis. When properly

performed, comptrollership will enable the commanding officer to spend more of his time in the areas of policy formulation, decision, and program direction.

The Shop Superintendent's staff is in effect the staff of the Production Officer and is responsible for carrying out exactly the above service in all areas except that of production analysis. And when properly performed allows him not only time for the enumerated management activity but also time for frequent inspection of work in progress.

1. Integrated System for Financial Management.

Establishes, coordinates, and maintains an integrated system of staff service that will provide to the commanding officer the factual data essential for effective management control of operations. Provides technical guidance and direction in financial matters throughout the organization. . . the collection of obligation, expenditure, cost, and other accounting and operating statistics data, and for a review of program performance and of the pattern of resources utilization, promotes economy and efficiency in the performance of assigned programs.

The Shop Superintendent basically performs this function for the Production Officer, but he shares the responsibility with the Production Analysis Officer who provides service in the area of production control and analysis on productive work.

2. Budgeting provides guidance and instructions for preparation of the budget; reviews resources, requirements and justifications for the various programs and prepares estimates of the cost thereof; compiles the annual budget; in connection with the budget process, recommends allocation of funds and civilian personnel to programs within the command, and revisions thereof as required; analyzes variances from the budget plan and recommends remedial action where appropriate; determines areas where desirable financial reprogramming may be effected; initiates action to adjust financial plans to available funds and, when required, submits requests for additional funds with justification.

There can be little doubt that this function is performed for Production by the Administration Branch with an assist from the other Shop Division branches.

3. Accounting and Disbursing. Within the framework of the Navy-wide accounting system and policies: . . . Prepares accounting reports for local management . . .; conducts cost accounting operations; maintains plant property records and financial records of inventory transactions of all classes of property, and submits all property returns; supervises and conducts timekeeping operations. . .

This is the area of line responsibility for the Comptroller. The Shop Superintendent performs line responsibilities in the area of manufacturing and non-ship work. In addition the Administration Branch analyzes and engages in cost accounting operations and supervises timekeeping for

Production. All branches implement the reports generated by the Comptroller and determine the need for such additional reports as may be required. The Plant and Processes Branch maintains subsidiary records on plant property and transactions which are one of the major sources of data for the master control record maintained by the Comptroller.

> 4. Program Analysis. Measures and analyzes performance, program status and trends against approved programs and budget plans and schedules, and reports the results of operations to responsible levels of command. . . . This function of comptrollership is considered an extremely important staff service to the commanding officer who has the responsibility for decisions. Analyses and comparisons should be timely and presented with recommendations for action or decision so that funds may be used effectively and economically.

This is and has been a basic responsibility of the Shop Superintendent to the Production Officer for the Production Department. It is probable that this function can be greatly improved however. Every Shop Superintendent should review his compliance with this important duty.

> 5. Progress Reports and Statistics. Developes guides and criteria for the collection and coordination of statistical data and prepares special statistics as required by the responsible levels of command. . . . Statistical reports should be rendered in time and in a manner that will insure optimum use by management.

This responsibility for the Production Department is shared by the Shop Superintendent with the Production Analysis Officer. There is ample work here for each. The Shop Superintendent is in a position to present very effective statistics on such things as the cost of non-ferrous castings per pound in the foundry or the unit maintenance cost on machine tools in the machine shop, etc.

Thus we see that the Shop Superintendent performs essentially all the functions that the Comptroller does, but delimited to the Production Department, and in addition he has the responsibility for all industrial relations, management engineering, industrial engineering, plant equipment and facilities program, and other miscellaneous services as assigned for the Production Department.

It is worthwhile to paraphrase a few additional sentences from this statement of policy.

One being that: "The comptroller (shop superintendent) recommends to management, but does not make management decisions. Accordingly, management should look upon the comptroller (shop superintendent) as a continuing source of ideas and advice on managerial problems."

Another is: "The comptroller (shop superintendent) should report directly to the activity head in order that the greatest potential value may be realized from the staff services performed."

A very pertinent one: "The full potential of the organization will be realized only if management secures competent personnel to staff the function and then insures that the unit head is providing a <u>complete, concise, and effective service</u>."

This one is quite applicable to the Shop Superintendent also: "The complex and continuing nature of the comptroller (shop superintendent) function is such that the qualifications of an officer appointed as comptroller (shop superintendent) are most important to the effective discharge of his responsibilities. The officer so appointed should have had broad experience with operating programs and problems and general management responsibilities. He should have keen analytical ability and be capable of making discriminating judgments as well as be able to express concisely and effectively his conclusions and recommendations in either written or verbal form."

The consensus of opinion of the majority of the leaders in the field is that the Comptroller should be a part of top management and a man of management caliber, not a narrow specialist. The Navy Department policy as enunciated in the various directives would indicate that such is the intent concerning Comptrollers of naval activities. Certainly such is the case for Shipyard Comptrollers. And it is interesting to note that such is the case for the Shop Superintendent within the Production Department and in some respects in the Shipyard.

CHAPTER XII

A Manager And Administrator

The Shop Superintendent has many more specific duties than any one person could hope to carry out. In addition he must be available to talk to the personnel of the Production Department about their problems. There is seldom a day that goes by without his participating in at least a dozen informal discussions. This is all part of the establishment of a cordial working relationship with all elements of the Production Department. But the difficulty is that it consumes, on an average, one half of the working day and the Shop Superintendent may find himself at his desk long extra hours trying to keep up with the work. It presents a pretty rugged picture doesn't it?

The answer is that the Shop Superintendent must be familiar with and <u>live</u> scientific management. He is in a junior manager's billet, he must work like a manager, and he must be an excellent administrator. One author defines administration as "the necessary activity of those individuals in an organization who are charged with ordering, forwarding, and facilitating the associated efforts of a group of individuals brought together to realize certain defined purposes." This is a broad definition but it covers the essential elements of administration.

The one essential feature of being a good manager which should always be in the forefront of our mind is that of delegation of responsibility and authority. The Branch heads and the Assistant Shop Superintendents are responsible members of the management team and should be treated as such.

Every possible duty should be delegated to them. And of course parallel with the responsibility for action must go the authority necessary to carry it out. We should reserve only the policy decisions for ourself. It is difficult for most people to effectively delegate, but it is essential that we develop our ability in this respect. A recent survey and study was conducted of twelve industrial firms with respect to their executive environment and patterns of action. Three of the conclusions reached were:

(a) The top management function is no longer a one man job, it should be a team.

(b) Most of the executives observed could have relied on subordinates to a greater extent.

(c) For effective communication and understanding, there is no substitute for face to face contact.

Let us review these as they apply to the Shop Superintendent's responsibility area.

The team concept of management appears to me to be a very desirable one for this area. As mentioned in an earlier chapter the Shop Superintendent seldom stays in the job long enough to become proficient in all of the diverse duties involved. What is more logical than a periodic meeting of all Branch heads and Assistant Shop Superintendents to discuss the current problems and long range plans of the organization. By this means each is guided by the top policy as emunciated by the Shop Superintendent. Further, each is made cognizant of the over-all picture and can shape his portion to fit into the whole. These members of management must not be permitted to drift along as

narrow specialists. They are junior managment and should think as managers for the welfare of the whole organization. They must shape their thinking to progressing forward; if this is not done the whole organization will regress. The Shop Superintendent has a golden opportunity to lead his management team to a fully effective staff service for the Production Department, a goal seldom reached.

The reliance upon subordinates has been discussed earlier in this chapter. Suffice it to say that this principle of operation can never be over-emphasized since it is of supreme importance.

Although at first glance it may appear that face to face contact method of working entails the use of too much time, in practice it will be found that such is not the case. Communications are not completed until the receiving individual has understood the message. Many times in written transmissions misinterpretations result which cause loss of time and necessity for retransmitting, etc. In addition, in written communications the sender and receiver can use only one of his physical senses. By face to face contact we add the sense of hearing and the benefit of facial expression and voice intonations, which increase the probability of understanding by at least 100 percent. So, in the long run, we will invariably find that face to face is the more effective means of communication and is not an uneconomical use of our time.

The majority of people will generally take the easy comfortable way out on a problem. They will develop a routine pattern (rut) of operation and pursue it to the exclusion of all else. From such habits come the

bureaucratic fossilism which we often hear ridiculed. By the same token, it has been my experience that very few civil service workers will not work enthusiastically and hard when given some interest incentive and a well defined goal. It is for this reason that the Shop Superintendent must rise above every day events and through leadership incite his employees to greater effort in the struggle for economic and efficient performance of assigned tasks.

Suggested reading:

The Art of Leadership - McGraw-Hill 1935)
) both by
The Art of Administration - McGraw-Hill 1951) Ordway Tead

Conference Leadership in Business and Industry - McGraw-Hill 1945
by E. S. Hannaford

Principles of Administration (Excellent book) - Volume IV of "Emergency Management of the National Economy" edited by B. H. Williams. Published for Industrial College of the Armed Forces, Washington, D. C. - 1954.

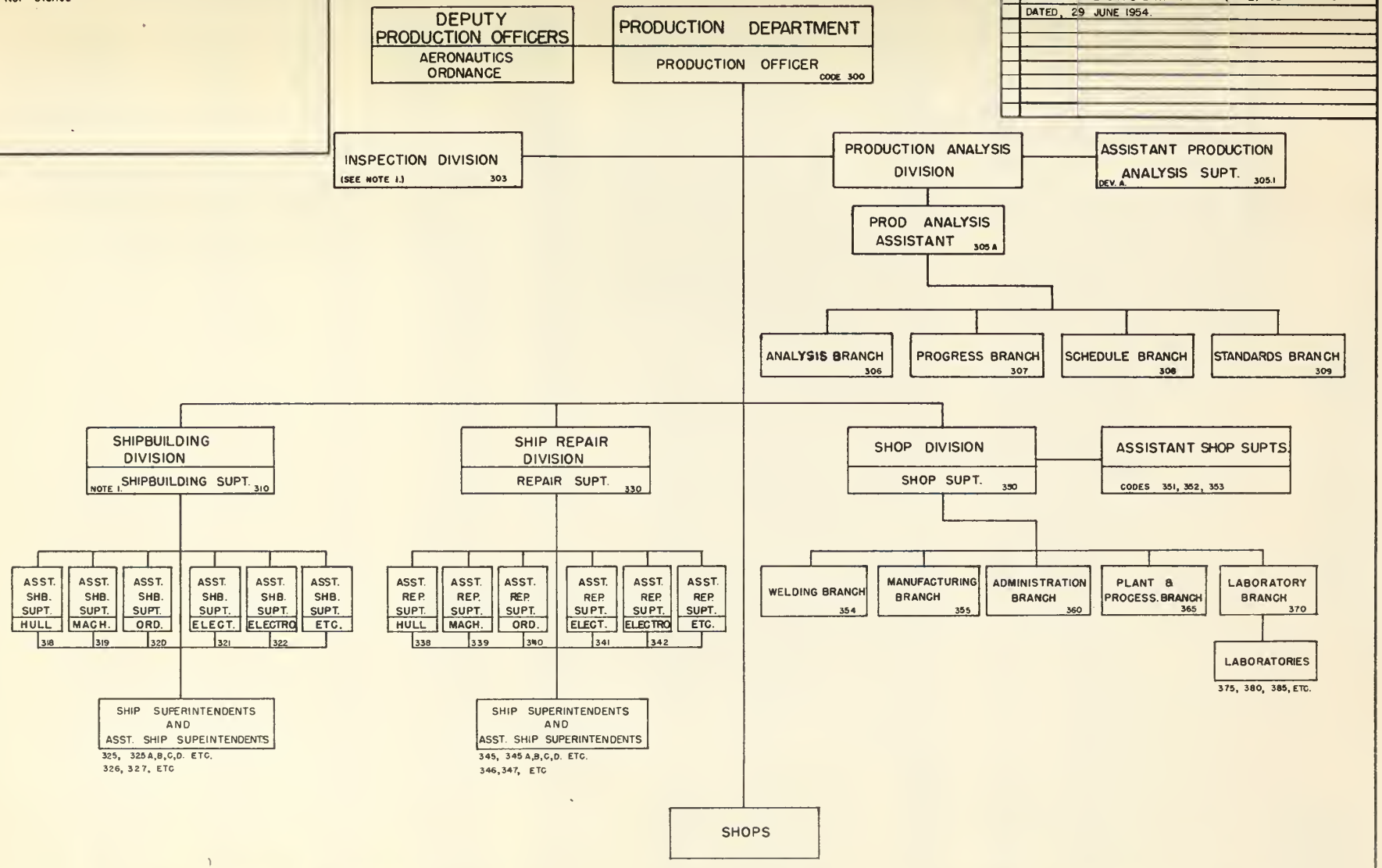
APPENDIX

NOTES:

1. Not Staffed

DEVIATIONS:

A	AUTHORITY: BUSHIPS LTR. NY/B/A3(741B) SER. 741-438
	DATED, 29 JUNE 1954.



DATE	APPROVED	MANAGEMENT BUREAU	PUGET SOUND NAVAL SHIPYARD	DEPARTMENT OR OFFICE	CHART NO.
2 SEPTEMBER 1954	(Title) RADM, USN, SHIPYARD COMMANDER	BUREAU OF SHIPS	BREMERTON, WASHINGTON	PRODUCTION DEPARTMENT	3

NAVY-DP&PO 13ND BREM., WASH. 1

PUGET SOUND NAVAL SHIPYARD
Bremerton, Washington

PRODDEPT 5400.1
Code 362
15 December 1954

PRODDEPT INSTRUCTION 5400.1

From: Production Officer
To: Distribution List PROD

Subj: Shop Division; responsibilities of

1. Purpose. To provide information regarding staff functions performed by the Shop Division of the Production Department.

2. Cancellation. Production Department Manual Article No. I-2-3 and No. I-2-4.

3. Responsibility. Responsibilities of organizational components of the Shop Division are listed below. Detailed information regarding specific services may be obtained from the code primarily concerned.

a. Shop Division (Code 350). The Shop Superintendent (the Assistant Production Officer for the Shop Division) is responsible to the Production Officer and to his deputies for all nonship work assigned to the Production Department and to the Production Officer for proper execution of all service and administrative functions required for proper operation of the Department, and for such other special duties as may be delegated to the Shop Division from time to time except for those specifically assigned the Production Analysis Division. The purview of the Shop Superintendent shall encompass such broad functions as:

(1) The good housekeeping, space, and security assignment of all areas and buildings of the shipyard under the cognizance of the Production Department.

(2) The provision and maintenance of proper and adequate portable and fixed tools, appliances, and facilities to permit the Production Department to accomplish its work in accordance with the mission of the Shipyard.

(3) The accomplishment of such manufacturing and nonship work as may be contracted for by the Planning Department and issued to the Production Department.

(4) The development, establishment, publishing, review and improvement of all production processes, procedures, and work practices required in the accomplishment of productive work.

(5) The conducting of research and development projects as assigned by BuShips to improve materials, techniques, standardization and specifications. This work includes manufacturing processes, trial installation of new materials, development of techniques for using new materials and applications, and determination of characteristics and basic properties of materials.

(6) The implementation of all Industrial Relations functions as applicable to the civilian personnel of the Department.

(7) The accomplishment of all administrative matters of the Department pertaining to civilian personnel, space, facilities, organization, and shop administration. This includes such features as:

(a) Review of organizational structures and functions and their improvements to provide for most efficient and economical operation.

(b) Administration of the forms and reports control program.

(c) Development, establishment, and improvement of productive work standards, guides, and management procedures.

(d) Personnel Performance Evaluation Program.

(8) The development and implementation of a sound and effective fiscal budgetary program for the Department and the review and improvement of shop overhead rates.

(9) The provision of Laboratory services in the fields of chemical engineering, metallurgical engineering, radiology, rubber and plastics, plastic laminates, wood technology, material and test engineering and physical testing for the Shipyard, associated district activities, and Naval Inspectors of Material as required.

(10) The provision of engineering services in the field of welding and associated processes to the Shipyard and associated activities.

(11) The establishment of an adequate shop stores program and an effective material distribution and handling system.

(12) The establishment and implementation of a firm and consistent policy on trade cognizance determination and trade cognizance dispute conciliation, consulting with the Chief Planner and Estimator and the Labor Relations Branch (IRD) as necessary.

(13) The Shop Superintendent, in carrying out his responsibilities, has under his administration various Assistant Shop Superintendents as assigned and the following branches with their respective branch heads:

(a) Administration

(b) Plant and Processes

(c) Laboratory

(d) Welding

(e) Manufacturing

b. Assistant Shop Superintendents. An Assistant Shop Superintendent is responsible to the Shop Superintendent for such duties as the Shop Superintendent may assign.

c. Welding Branch. The Shipyard Welding Engineer, as Head of the Welding Branch, is assigned as a staff assistant to the Shop Superintendent. He shall supervise all welding engineers carried on the rolls of the Shipyard, properly administer the Welding Branch, and consult with and advise all department heads and masters on all matters under their cognizance involving welding or processes allied to welding, such as brazing, gas cutting, metallizing, hard facing, etc.

(1) The Branch shall have primary control of the development of welding and allied processes and in the preparation of welding procedures, including the following:

(a) Prepare welding sequences and procedures in collaboration with other interested departments when welding procedures and processes to be used affect the activities of other shops and departments.

(b) Develop procedures for the use of welding and allied processes required for, or which may be useful, in the work of the Shipyard.

(c) Specify, other than where covered by specifications, the extent, type (i.e., visual, nondestructive or destructive) and methods (i.e., X-ray, magnetic particle, weld probing, etc.) and determine applicable standards for inspection of all welding.

(d) Correlate and distribute welding information to Shipyard personnel concerned.

(e) Evaluate Welder Qualification Tests.

(2) The Branch shall conduct tests of procedures for the application of welding and allied processes, and prepare such reports as are necessary in connection therewith to obtain Bureau approval for their use. Also test and prepare technical reports in connection with investigations as to suitability of welding materials and accessories or to verify the weldability of base metals to be used by the Shipyard.

(3) The Branch shall act as consultant and advise all departments and shops on welding and brazing problems involving design or changes in design, weldability of materials being considered, ways of increasing welding economy, safe use of welding equipment and materials, layout of Shipyard welding facilities and equipment, acceptance or rejection and corrective action of weld inspection, training programs, repair of equipment.

d. Manufacturing Branch. The Head of the Manufacturing Branch is responsible to the Shop Superintendent for:

(1) The proper supervision and administration of the Branch.

(2) The coordination of all nonship work:

(a) The review of schedules assigned to determine acceptability.

(b) The review of work progress and liaison with the assigned progressmen to assure timely completion of the work.

(c) The surveillance of return costs on nonship work to assure economy of work performance.

(d) The surveillance of quality control methods in use in the shops to assure a fully satisfactory product.

(3) Liaison with the Production Analysis Division and the Planning Department to provide for an orderly acceptance of work in accordance with the available manpower of the various shops.

(4) The timely and proper submission of required progress and other reports with respect to nonship work.

e. Administration Branch. The Head of the Administration Branch (Code 360) is responsible to the Shop Superintendent for:

(1) General responsibilities.

(a) The development and implementation of administrative and personnel policies and procedures applicable to all Production Department civilian personnel.

(b) Departmental procedure and management surveys and controls, training coordination, management engineering, work measurement programs, forms and reports management, and the coordination of safety, fire prevention, and housekeeping, and other departmental programs.

(c) Budget and funds control, development and administration of departmental budgets and overhead expenses.

(d) Other special projects and administrative functions as assigned, such as mobilization planning, passive defense and trade cognizance problems.

(e) Provide necessary clerical file and mail service to Production Department personnel.

(2) Duties and responsibilities of the Administration Branch.

(a) The scope of work performed by sections under direction of the Head of the Administration Branch (Code 360):

1. Departmental Personnel Administration Section (Code 361).

a. Personnel practices, appointments, placements, transfers, promotions, salary and wage changes, disciplinary actions and reviews, separations, removals, retirements, reduction in force.

b. Implements the policies for establishment or disestablishment of ungraded ratings, Production Department ceilings, absenteeism, annual and sick leave, performance ratings, maximum utilization of manpower and personnel needs.

c. Maintaining close liason with the Industrial Relations Department, advising Production Department Heads of material changes, providing guidance and assistance in interpreting and complying with regulations, policies and procedures regarding Industrial Relations and Personnel Administration problems.

2. Management, Organization and Administrative Analysis Section (Code 362).

a. Developing and making studies and recommendations for administrative work, policies, procedures and programs for the Department.

b. Conducting management studies to develop work standards and guides and more efficient methods of operation.

c. Correlating, reviewing, and preparing the departmental directives.

d. Administering the forms and reports management program.

e Coordinating departmental IVb's Position Description Program; reviewing, developing, and providing assistance in the preparation of position descriptions.

f Coordinating departmental training, material conservation, safety, fire prevention, housekeeping, X-ray, blood donation, and similar programs.

g Developing and administering work measurement, methods improvement, mobilization, and passive defense program problems.

h Making analysis of, and recommending solutions to trade cognizance problems.

i Analyzing needs, coordinating and determining procurement policy for labor saving office machines, office furniture, and other office equipment.

j Clerical Pool and Administrative Services Unit (Code 362F).

(1) Providing IVb timekeeping, stenographic, and typing pool services for the Production Office.

(2) Providing necessary mail, messenger, clerical, and filing services to personnel when not otherwise provided.

(3) Preparing IVb personnel actions and maintaining official personnel records.

(4) Conducting training program for new IVb clerical employees.

(5) Ordering and maintaining specifications, machinery, tools, and material catalog files.

(6) Preparing all departmental travel orders, requests and endorsements.

(7) Ordering and issuing office supplies.

3 Departmental Budget and Funds Control Section (Code 363):

a Developing actual monetary performance budget estimates for labor and material needs for all departmental cost centers.

b. Developing accounting policies and exercising control over department accounting functions.

c. Developing and maintaining data and records for administrative and budgetary controls.

d. Studies and analyzes overhead and special project expenditures.

e. Keeps heads of shops, branches and divisions in the Production Department informed as to the status of overhead and special project funds.

f. Prepares cost analyses for the various cost classes and functions as related to performance budgeting.

g. Compiling and estimating of process labor, maintenance, operating, and material costs for the three process shops; furnishing information to the Comptroller's Department regarding accrued costs for calculations governing establishment of rates for costing the product produced.

f. Plant and Processes Branch.

(1) General responsibilities. In accordance with reference (a), the Head of the Plant and Processes Branch is responsible to the Shop Superintendent for:

(a) The adequacy of maintenance and the development, improvement, and arrangement of plant equipment and facilities; and the maintenance of necessary plant account records.

(b) The approval and preparation of requisitions for machine tools, equipment, loose and hand tools, and portable power tools; the supervision of installation and final acceptance tests; and submission of performance reports and recommendations as to specification requirements for Naval Shipyard Tool and Tooling Standardization Program.

(c) The development of studies and the preparation of justifications for Shipyard Development Board items.

(d) The development and improvement of production processes, practices, and services.

(e) The application of adequate safety appliances to plant equipment and the establishment of safe work practices in Production Department shops in connection with processes and equipment.

(f) The insurance that adequate equipment and emergency gear is available, properly placed, and in usable condition as required by emergency bills.

(2) Organizational Functions. The scope of work performed by sections under the direction of the Head of the Plant and Processes Branch (Code 365):

(a) Plant Engineering and Production Processes Section (Code 366).

1. Develop new or improve existing production processes.

2. Application of new industrial developments and methods to Shipyard use.

3. Prepare flow charts of production processes.

4. Compile technical instructions.

5. Develop studies, plans, and specifications; and prepare justifications on items for Shipyard Development Board, nonrecurring maintenance and minor construction program.

6. Prepare shop layouts of plant equipment and facilities.

7. Design new or modify design of existing plant equipment.

8. Perform field engineering on plant projects.

9. Provide technical information to shops on plant equipment.

10. Provide adequate safety appliances for plant equipment.

11. Investigate failures of plant equipment and redesign weak or faulty parts to insure proper operation.

(b) Tool Engineering Section (Code 378).

1. Devise and place into operation new tooling techniques.

2. Introduce new tools into the Shipyard.

3. Conduct high performance tests of loose and hand tools as directed by the Bureau of Ships.

4. Approve design, specify materials and physical requirements for tools, dies, and jigs.

5. Review requests for special tools.

6. Perform consulting engineering functions in conjunction with shop tooling problems.

7. Establish types and quantities of tools and equipment required for mobilization in accordance with Bureau of Ships directives.

(c) The Procurement, Job Order, and Material Control Section (Code 367).

1. Determine machine tool and plant equipment requirements for Production Department activities.

2. Develop studies, prepare specifications and justifications for the plant equipment program.

3. Prepare specifications and initiate procurement of machine tools, plant equipment, material handling equipment, loose and hand tools, portable power tools, repair and maintenance parts, safety equipment, and special consumable supplies for all Production activities.

4. Supervise installation and conduct acceptance tests on all machine tools and plant equipment.

5. Establish maintenance procedures, schedules, and spare parts allowance for all machine tools and plant equipment.

6. Compile estimates and prepare job orders for plant work.

7. Establish policy and verify compliance of tool control systems in shop 06.

8. Insure that adequate equipment and emergency gear are available as required.

9. Maintain plant account records and conduct plant inventories as required.

10. Coordinate and direct the operation of the movement and storage of all material and equipment used by the Production Department between various shops and the waterfront.

11. Determine requirements and initiate procurement and/or standardization of special nonstandard material for which there is a recurring demand.

12 Direct the operation of shop stores for the Production Department.

13 Furnish technical advice in regard to the solution of material problems involving stocking, improvement, substitution, requirement, disposal and procurement.

g. Laboratory Branch. The Head of Laboratory Branch is responsible to the Shop Superintendent for:

(1) The efficient administration and coordination of the Material Laboratories in the performance of scientific and technical work for the Shipyard departments, shops and outlying Naval activities; in the fields of chemistry, metallurgy, chemical and metallurgical engineering, radiology and radiography, rubber and plastics, wood technology, material and test engineering, and physical testing. Consulting with heads of shops and activities and providing technical guidance on problems of basic science, laboratory phases of engineering, and tests and inspection of materials.

(2) The development of materials for specific applications and development and maintenance of improved chemical and metallurgical processes for increased efficiency, safety and economy of operations, and advising the shop heads of proper procedures for control of quality of processes and products.

(3) Conducting research and development on projects as assigned by BuShips to improve materials, techniques, standardization and improved specifications; involving manufacturing processes, trial installation of new materials, development of techniques for using new materials and applications, and determination of characteristics and basic properties of materials. Projects include decking materials, laminating wood, adhesives, impregnation and preservative treatments, elastomer materials, sheet plastics, laminated phenolics, reinforced plastic boats and other products, shaft bearing preservation and others as assigned.

(4) Gas-free engineering services for maintaining safe conditions for hot work and entry into closed spaces, selection of methods to inert spaces for welding and to prevent scale formation and training of shop personnel for air testing. Specify material and processes, and provide technical assistance to shops in: chemical cleaning and descaling of heat transfer and cooling equipment, tanks, cylinders, piping, boilers and metal structures; and the removal of moisture, oil, or other foreign matter from equipment.

(5) Providing metallurgical services to the Foundry and Forge Shops and attesting to the quality of castings and forgings as regards chemical

composition, physical properties and radiographic soundness, determine proper heat treatments to develop specific properties and specify basic heat treatments of all metal products. Determining feasibility of, and authorizing welding to repair defects in castings and forgings.

(6) Quality control and inspection tests for compliance with applicable specifications on laminated wood, wood products, fibrous materials, adhesives, rubber, plastic products, plating and pickling solutions, metal products, fabrics, chemicals, raw materials, and other specific products.

(7) Conducting on castings, forgings, weldments, lifting equipment, structural members, machinery parts and other wrought metal products; all nondestructive examinations, all examinations for wear, corrosion, fatigue, hardness, thermal properties, metallographic and micrographic structure; photoelastic stress analysis to determine points of stress; and measurements in the field of physics as related to optics and magnetism. Interpreting results of examinations and recommend rejection, acceptance, repair of parts examined, or substitution of materials to increase service life.

(8) Radiological monitoring, training of monitors, decontamination services and advice on Passive Defense as related to technical laboratory services and information.

(9) Investigation of service failures of materials and making recommendations to correct causes of failure.

(10) Chemical analysis of ferrous and nonferrous metal alloys, and analysis, examination and evaluation of industrial materials, chemicals, drugs, and petroleum products. Conducting investigations of such materials as to fitness for end use.

(11) Identifying and classifying all unknown material by means of chemical and physical analysis and making recommendations to shops, departments and other activities in the use of substitutions for unavailable material and to conserve materials and metals.

(12) Serving as testing agency for the Inspector of Naval Materials for materials procured in the Thirteenth Naval District, and providing representation on Shipyard Technical Committees.

J. B. DUVAL, JR.

PUGET SOUND NAVAL SHIPYARD
Bremerton, Washington

PRODDEPT 5400.2
Code (305) (362)
15 December 1954

PRODDEPT INSTRUCTION 5400.2

From: Production Officer
To: Distribution List PROD

Subj: Production Analysis Division; responsibilities of

1. Purpose. To provide information regarding staff functions performed by the Production Analysis Division.

2. Cancellation. Production Department Manual Articles I-2-1 and I-2-2.

3. Responsibility. The responsibilities of organizational components of the Production Analysis Division are listed below. Detailed information regarding specific services may be obtained from the code primarily concerned.

a. Production Analysis Division (305). The Production Analysis Superintendent is responsible to the Production Officer for the over-all supervision, administration, and coordination of his division; and for the development and installation of an effective Production Planning and Control system within the Production Department, and for such other specific duties as the Production Officer may assign. Specific responsibilities include:

(1) Determining, preparing, and distributing work schedules for all ship and nonship work undertaken by the Production Department; coordinating material, plans, and labor into an orderly plan within the allocated time periods.

(2) Determining of job status in terms of physical completion, and maintaining records relating this information to manpower expenditures and available funds.

(3) Maintaining liaison within the Production Department and with other shipyard departments to secure necessary information for the operation of the Production Planning and Control system.

(4) Analyzing returned job costs in relation to estimates and developing suitable recommendations to improve over-all Production Control.

(5) Analyzing force distribution information and maintaining suitable records reflecting future manpower requirements, current work commitments, and backlog for all work assigned the Production Department.

(6) Progressing of all productive work (including nonship work), expediting plans and materials, the obtaining of prompt information relative to delays or schedule deviations in work progress due to any cause, and the prompt reporting of this information to the Production Officer.

(7) Furnishing workload or productive labor data as required for the preparation of budgets, overhead rates, and for balancing shop workload.

(8) Developing productive job standards and standard schedules; maintaining a complete current library of job standards; developing and maintaining performance data (this data not to be used in conjunction with personnel actions) based on production job standards which indicate the productive effectiveness of shops.

b. Assistant Production Analysis Superintendent (305.1). The Assistant Production Analysis Superintendent, acting in a staff capacity, shall be responsible for such assignments, tasks, and services as the Production Analysis Superintendent may assign.

c. Analysis Branch (306). The Head of the Analysis Branch is responsible for:

(1) Maintaining graphic or tabular status records of all work in the Production shops reflecting:

(a) Labor requirements for each ship or project by allotment, planning estimate, or project order for each shop as generated by the Planning Department's job order estimates.

(b) Expenditures against these requirements as reported by the Comptroller Department.

(2) Receiving shop planning estimates and maintaining suitable records to provide for control of labor expenditures at the allotment, planning estimate, or project order level for all ship work or customer order work, but excluding shop expense work.

(3) Maintaining a daily comparison of labor expenditures against customer order to insure adequacy of planning estimates. Notifying Planning Department in advance when possible overexpenditure is apparent and stopping work prior to occurrence of such overexpenditure if additional funds are not made available.

(4) Requesting adjustment in over-all Planning Department estimates when they vary substantially from shop estimates at the allotment, planning estimate, or project order level.

(5) Developing manning curves from current preliminary schedules and past force distribution data to be used by the shops and Repair Superintendent as a guide for manpower requirements and assignments.

(6) Analyzing force distribution information and physical progress reports to determine trends indicating loss of control, and making recommendations for corrective action.

(7) Maintaining suitable records of backlog and work commitments.

(8) Maintaining records and providing information on current and proposed workload and capacity of each shop and the total Production Department incorporating shop and Planning Department data as appropriate.

(9) Initiating information indicating the need for balancing an individual shop's workload.

(10) Conducting a continuing review of IBM schedule cards and force distribution cards for schedule adherence, recommending specific areas that require corrective action.

(11) Obtaining job cost returns and prepare reports for the Scheduling Branch and Standards Branch to develop over-all job standards for use in planning and estimating future jobs.

(12) Conducting special analysis in the field of Production Control, as directed by Code 305.

(13) Developing productive workload data, (expressed in men per day) and integrating with the overhead manpower data. Providing justification for and submitting the detailed manpower budget for the Production Department broken down into the following components:

a. Productive shop labor by work category.

b. General expense man-days by work category.

c. Productive overtime man-days by work category.

d. Military support man-days by functions.

e. Absences (man-day estimates) - annual, sick, unpaid and other.

d. Progress Branch (307). The Head of the Progress Branch is responsible for:

(1) Determining the status of productive work (including nonship work) in terms of schedule adherence and physical progress; obtaining prompt information on delays in work progress, and promptly reporting this information with recommendations for their correction.

(2) Expediting material as required and serving as material liaison point for the Production Department.

(3) Summarizing and reporting schedule deviations with causes thereof, based upon completed availabilities.

(4) Scheduling, progressing, and inspecting of compartments for completion on ships under construction or conversion (within framework of schedules established by the Scheduling Branch).

(5) Correlating information from the Shceduling Branch and Standards Branch, Repair Superintendent, Planning and Estimating Superintendent, Docking Officer, and originating and distributing the Bi-weekly Schedule of Drydocking and Ship Repair and Conversion.

(6) Closing job orders to labor on completion of work and assembling information on unfinished work and replacement material requirements for the Production Department.

(7) Investigating major over and under expenditures at job order level as directed by Code 305.

(8) Exercising administrative control of the Production loop teletype system, and transmitting authorized messages and urgent work messages (job order supplements, etc.).

(9) Expediting plans after issue by Planning Department.

e. Scheduling Branch (308). The Head of the Scheduling Branch is responsible for:

(1) Determining, preparing, and distributing master work schedules (including nonship work) based on the general scope and magnitude of authorized work.

(2) Determining, preparing, and distributing basic work schedules based upon availability of materials, plans, manpower, and desirable erection sequence.

(3) Preparing and distributing detailed work schedules on job order supplements based upon approved basic work schedules.

(4) Furnishing required delivery dates for planned material requirements, plan preparation, and job order issuance to the Planning and Supply Departments on productive work.

(5) Reviewing material and plan delivery status information on productive work, manpower availability, and revising detailed work schedules as required during execution. Reviewing previously established, required dates on plans and materials, and revising the required dates as necessary.

(6) Conducting scheduling conferences and attending conferences affecting scheduling action.

(7) Developing standard schedules for repeat-type manufacturing repair and alteration work items.

(8) Developing standard sequences for accomplishment of productive work by type of ships and type of availability for use in scheduling.

(9) Furnishing guidance to the Planning Department in development of work specifications best suited for effective scheduling.

(10) Conducting a review of schedule adherence on completed availabilities, and making recommendations to correct causes of the departure from schedules, based upon information supplied by the Progress Branch.

(11) With the workload information provided by the Analysis Branch, schedule work to the shops' productive capacity and/or adjust previous scheduled dates to balance shop workload.

(12) Conducting feasibility studies to make recommendations regarding the advisability of revising scheduled principal events, dates, or the acceptance of future availabilities.

f. Standards Branch (309). The Head of the Standards Branch is responsible for:

(1) Furnishing guidance and technical assistance in the administration of the Production Planning and Control Program in the Production Department.

(2) Developing Production Planning and Control procedures, methods, and delineating the contents of the forms, wherein they apply to Shop Planning and Job Standards.

(3) Recommending the necessity for, and establishing a relative priority for equipment and personnel required in the implementation of the Production Planning and Control Program.

(4) Acting as the Production Department liaison point in connection with the Production Planning and Control Program.

(5) Utilizing information generated by the Production Planning and Control Program as a basis to developing and maintaining data indicating the productive effectiveness of the shops.

(6) Reviewing Shop Planning Office records and assisting in development of standard estimating data for individual shops.

(7) Consolidating individually prepared shop standards and developing over-all production standards for jobs to be used for planning, scheduling, and estimating future work. Maintain the Production Department Library of Standards.

J. B. DUVAL, JR.

genHF 5550.G3y1955 v.1
Navy graduate comptrollership program te
3 2768 001 98672 2
DUDLEY KNOX LIBRARY